NAVAL POSTGRADUATE SCHOOL

MONTEREY, CALIFORNIA

THESIS

THE EFFECT OF DIFFERENT ENLISTMENT AGES ON FIRST-TERM ATTRITION RATE

by

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March 2014

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14. SUBJECT TERMS Attrition, Enlistment age, Character disorder, Demographics			**15. NUMBER OF PAGES** 89
			16. PRICE CODE
17. SECURITY CLASSIFICATION OF REPORT Unclassified	**18. SECURITY CLASSIFICATION OF THIS PAGE** Unclassified	**19. SECURITY CLASSIFICATION OF ABSTRACT** Unclassified	**20. LIMITATION OF ABSTRACT** UU

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**THE EFFECT OF DIFFERENT ENLISTMENT AGES
ON FIRST-TERM ATTRITION RATE**

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Submitted in partial fulfillment of the
requirements for the degree of

MASTER OF SCIENCE IN MANAGEMENT

from the

**NAVAL POSTGRADUATE SCHOOL
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LIST OF ACRONYMS AND ABBREVIATIONS

AFQT	Armed Forces Qualification Test
BLPM	Binary Linear Probability Model
CAT	category
COS	Character of Service
DEP	Delayed Entry Program
DMDC	The Defense Manpower Data Center
DOD	Department of Defense
GED	General Education Development
JROTC	Junior Reserve Officers' Training Corps
ISC	Inter-service Separation Code
MOSs	military occupational specialties
NPS	non-prior service
OLS	Ordinary Least Squares
PS	prior service
SRBs	Selective Re-enlistment Bonus

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ACKNOWLEDGMENTS

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I.   INTRODUCTION

United States Armed Forces have recruited a great numbers of enlistees for each year since the beginning of the all-volunteer force in 1973. Although these enlistees are required to stay in the military until the end of their contracts, it is found that many do not fulfill this commitment. The goal of this thesis is to determine the effects of different enlistment ages on first-term attrition rates in the United States Marine Corps, Air Force, Navy, and Army enlistees between 1995 and 2013. In addition, this study focuses on developing an empirical model to calculate the real effect of enlistment age on attrition. The United States Armed Forces have engaged in many more operations worldwide since the September 11, 2001, attacks on the Pentagon and World Trade Center. Operation Iraqi Freedom, Operation Noble Eagle, Operation Enduring Freedom are the three vital operations of the critical period that has increased the manpower needs of the Services. Additionally, state annual unemployment rates that are acquired by The Bureau of Labor Statistics are examined to calculate the true effect of enlistment age on first-term attrition rates. Many variables are used in our analysis for four branches of the United States Armed Forces, including demographics, education, Armed Forces Qualification Test (AFQT) category variables, the unemployment rate variable and regional differences.

Our study also aims to determine the optimum enlistment age whether there is, thus it will help recruiters to select the most suitable candidates from the large applicant pools for the forces and will reduce the training and recruiting cost. In this paper, we study a new approach that intends to reduce recruitment cost of the U.S. Armed Forces by focusing on the enlistment age.

A.   BACKGROUND

1.   Recruiting

According to DOD officials, recruiting is the military services' ability to bring new members into the military to carry out essential tasks in the near term and to begin creating a sufficient pool of entry-level personnel to develop into future mid-level and upper-level military leaders. Since the military has to choose recruits who are the best candidates among peer groups, they invest large amounts of money to recruit and keep qualified applicants.

United States Armed Forces have had difficulty in meeting the manpower requirements to support the military operations launched against terrorism after September 11 (GAO, 2005). Although the Navy has been confronted with some contingencies, recruiting goals succeeded during the fiscal years 2000–2009. However, Armed Forces recruiting policy must continue to focus on developing a more skillful and dynamic applicant pool to support operations. Recruiting competent enlistees is vital to national security, but is a costly process. For example, each year the U.S. Department of Defense (DOD) must replace approximately 11 percent of military personnel (about 160,000 troops), due to normal workforce turnover. In this endeavor, they are spending approximately $11,000 to recruit each new soldier (Department of Defense, 2013).

The DOD defines attrition as the failure of an enlistee to complete his or her contractual obligation. Attrition is one of the most serious and costly personnel problems faced by the U.S. military. Before basic training begins, recruits are obliged to take an enlistment oath and sign a 2–6 year contract to serve for one of the services. Some attrition occurs during basic training, which lasts from 6 to 12 weeks, depending upon the service. Some attrition occurs during initial skill training, which can last from a few weeks to more than one year, depending upon the enlistee's occupation. Finally, some attrition occurs after enlistees have reported to their first duty assignments. By the six-month point in an enlistee's first term, most have completed both basic and initial skill

training, and have been assigned to their first duty stations—though this is not the case for enlistees whose occupations require longer and more extensive training. Most attrition occurs during basic training or the first six months of active duty service (GAO, 2000).

Enlisted attrition involves direct costs (training costs) and indirect costs (damage to force stability). The first term of enlistment is usually a 4-year term, but some terms may be two-six years in length (GAO, 2000). Early separation of enlistees can happen at any time during the first term because of physical, medical, and performance problems, or fraudulent enlistment. Cost of recruiting new service members averages about $11,000 for each recruit, combined with an average cost of initial entry training at $35,000. As more than 200,000 of America's youth are recruited for active military service each year, the DOD's investment in military recruit accessions and training is enormous.

The latest available data from the DOD resources explains that the Navy has the highest first-term attrition rates with 13.6 percent in all of the active duty enlistees. The Army and Marines follow with 13.5 percent and 11.7 percentage points. In contrast, the Air Force has the lowest first-term attrition rate with 8.8 percent among the active duty enlistees. This study initially focused on that the fact that attrition and recruiting are parts of an unbreakable chain, which cannot be thought of separately. In their previous studies, researchers have discovered that those who enlisted before turning 18-years-of-age were more likely than any other age group to attrite. This study will try to investigate recruiting and attrition as a whole, and determine whether enlistment age should be taken in consideration in recruiting.

2. Research Questions

The primary questions of this study are focused on the effect of enlistment ages on the first-term attrition rates for the Army, Navy, Marine Corps, and Air Force.

1. What is the optimal enlistment age to increase the productivity in the Navy, Army, Air Force, Marine Corps?
2. Does the age-effect on attrition differ for men and women in the first-term?
3. Does the age-effect on attrition differ for race categories in the first-term?

B. SCOPE AND METHODOLOGY

While this study involves some overall historical attrition data, it also focuses on the detailed analysis of enlistees who entered the services between Fiscal Year 1994 and Fiscal Year 2013. This study focuses on Army, Marine Corps, Navy, and Air Force enlistees were screened from Fiscal Years 1995 to 2013.The scope of the thesis includes a review of studies about attrition without the effect of optimal enlistment age, an in-depth review of the effect of optimal enlistment age on of this section, and the evaluation of this effect in short-term and long-term attrition for U.S. Armed Forces.

The thesis concludes with a recommendation for the current Recruitment System of U.S. Armed Forces and provides attrition data for enlistees by educational background, AFQT score, and age at the time of enlistment, gender, and race/ethnic group. To determine historical first-term attrition rates, we obtained the data from the Defense Manpower Data Center (DMDC), whose primary purpose is to support the management needs of the Office of the Under Secretary of Defense for Personnel and Readiness. The data covered all enlistees with prior service who entered the military from Fiscal Year 1994 through 2013 and included the gender, educational background, age at enlistment, race, AFQT category, marital status, and separation code (for those who left the services). Because the majority of first-term contracts are for four

years, we made our calculation at the 48 months point to include the most recent data available (Fiscal Year 2013). Our method does not include the attrition of enlistees with 5- or 6-year contracts who were separated in their final one to two years of service.

C.   ORGANIZATION

The thesis consists of six chapters. Chapter I is an introduction and brief information about attrition related to the United States Armed Forces. Chapter II is a literature review of previous attrition studies, and any modeling studies that focus on the age variable. Chapter III is the explanation of all the variables that are discussed in the analysis. Chapter IV provides an analysis of the data with summary statistics. Chapter V explains methodology and presents the findings of the probit models to predict the effects of mainly enlistment age variables and other variables on attrition. Chapter VI concludes the thesis with a conclusion and recommendations from the findings.

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II.   LITERATURE REVIEW

A.   INTRODUCTION

Eighteen is thought to be the optimal draft age in most countries to use the enlistee's power, quick reaction, and tendency to learn. However, family environment and the lack of life experience can negatively affect the success of armed forces. Furthermore, politicians still discuss the morality and suitability of the early enlistment age.

Enlistment age varies among countries based on whether their armies are AFV. Most of the countries continue to accept enlistees at the age of 18. The lowest enlistment age is 16, with parental consent, in the following countries: Bangladesh, Egypt, El Salvador, Guinea-Bissau, Guyana, India, Iran, Korea, North, Mexico, Pakistan, Papua New Guinea, Tonga, United Kingdom, and Zambia. Within a specific country, minimum enlistment age differs according to forces and gender (CIA, 2013). Table 1 demonstrates some examples of different enlistment age policies around the world.

Table 1. Enlistment Ages around the World

Australia	17 years of age for voluntary military service (with parental consent); no conscription; women allowed to serve in most combat roles, except the Army special forces (2013)
Canada	17 years of age for voluntary male and female military service (with parental consent); Canadian citizenship or permanent residence status required; maximum 34 years of age; service obligation 3–9 years (2012)
China	18-24 years of age for selective compulsory military service, with a 2-year service obligation; no minimum age for voluntary service (all officers are volunteers); 18–19 years of age for women high school graduates who meet requirements for specific military jobs.
France	17-40 years of age for male and female voluntary military service (with parental consent); no conscription; 1-year service obligation.
Germany	17-23 years of age for male and female voluntary military service; conscription ended 1 July 2011; service obligation 8–23 months or 12 years.
Russia	18-27 years of age for compulsory or voluntary military service; males are registered for the draft at 17 years of age; service obligation is 1 year (conscripts can only be sent to combat zones after 6 months of training).
Turkey	21-41 years of age for male compulsory military service; 18 years of age for voluntary service; 12 months conscript obligation for non-university graduates, conscripts are called to register at age 20, for service at 21
United Kingdom	16-33 years of age (officers 17–28) for voluntary military service (with parental consent under 18); no conscription; women serve in military services, but are excluded from ground combat positions
United States	18 years of age (17 years of age with parental consent) for male and female voluntary service; no conscription; maximum enlistment age 42 (Army), 27 (Air Force), 34 (Navy), 28 (Marines); service obligation 8 years, including 2–5 years active duty (Army), 2 years active (Navy), 4 years active (Air Force, Marines)

Adapted from *The World Factbook*, 2013. Retrieved from https://www.cia.gov/library/publications/the-world-factbook/fields/print_2024.html

B.   ATTRITION AND REENLISTMENT

Although most studies include the effect of average age on attrition, promotion, and reenlistment, they have not defined the effect of enlistees' age during the contract year on attrition, reenlistment, and promotion.

Golan, Greene, and Perloff (2010) conducted an important study about U.S. Navy promotion and retention by race and gender. They determined that promotion rates depend on an individual's characteristics, war, economic conditions and factors that Navy policymakers can control. Their primary focus was on the question of whether Navy promotion rates differ across gender and race, and whether the Navy can alter its promotion and retention policies to maintain their sailors.

They estimated a bivariate probit model to examine the Navy's promotion, and an individual's reenlistment decision. They developed two equations, one of which directly related to individual's promotion rates based on ability and individual performance, and the other one represented the individual's decision to reenlist or to leave based on their promotion. Although they have used many variables to define the demographics and individual characteristics, they excluded the age variable in their research.

Greene and Perloff study determined that the probability of promotion differs across races, despite all the measures taken by the Navy. In addition, it was determined that promotion rates vary for men and women across pay grades. If civilian economic conditions improve, it will be more difficult to keep personnel in their current positions. They recommended that the Navy should raise promotion rates, pay higher selective re-enlistment bonuses (SRBs) to continue to increase the Navy's relative wage.

Buddin (2005) examined the effect of recruiting practices and recruit characteristics against the first-term success in his study. He developed a model to estimate the success of enlistees and recruitment programs by using first-term attrition, promotion, and reenlistment rates between the years of 1995–2001.

Because the primary focus of the study was the first-term success, the recent data was not used. His research examined recruit progress at various steps. In his study, he used three different models; attrition, promotion and reenlistment models. In the attrition model, he used age at time of contract variable and found a statistically significant effect on attrition.

Buddin's model tried to predict probability of a recruit in the Army to reach the E5 rank in his/her first-term service. Among other things, the control variables included race, gender, military occupational specialties (MOSs), AFQT scores, and educational background. The study found that Blacks, older recruits, those who had completed some college credits, and those with higher AFQT scores, had higher probabilities of promotion. On the other hand, being female or Asian, and having obtained a general education development (GED)—instead of a high school diploma—had a negative effect on promotion.

Reenlistment is another potential indicator of the success in the armed forces. Roy (2007) used enlisted data from cohorts between 1994 and 2002 to analyze reenlistment. He used econometric analysis and found that participation in JROTC increases the probability of reenlistment. Females who participate in JROTC reenlist at higher rates than both males and females that participate in no youth programs. Although his study provided beneficial results about the effect of JROTC on reenlistment, promotion, and attrition, he did not mention the effect of enlistment age, nor did he include the age variable into the model.

Three basic studies have analyzed variables that affect and individual's reenlistment decisions. One study looks at the effects of pay, selective reenlistment bonuses (SRB)/incentive pays, pay grade, and marriage on a military member's decisions to reenlist and remain in the armed forces. The second group of studies looks at aptitude test scores, race, gender, and educational background of recruits prior to entering the armed forces. The third and last group of studies analyzes the effects of youth programs (e.g., JROTC) on an individual's career decisions in and out of the armed forces.

The study that is the most similar to our work is Greenamyer's Master's Thesis (2009). His focus was on the effect of AFQT percentile scores and age on the Navy Delayed Entry Program (DEP) attrition. Men and women were analyzed separately, because of the differences in attrition by gender and sample size. He examined the effect of the enlistment age on DEP attrition, by using a Binary Linear Probability Model (BLPM). Greenamyer categorized the enlistees' ages into six groups: under 18, ages 18–20, ages 21–23, ages 24–26, ages 27–29, and over 30. He found that enlistees under 18-years-old were less likely to attrite, whereas the other enlistees in the different age cohorts are more likely to leave the service.

In his thesis, Jag (2009) analyzed the effect of selected demographic characteristics on first-term enlisted attrition from the U.S. Navy. The characteristics included age, marital status, dependency status, gender, race, AFQT score, and education credentials. Probit regression models were used to determine the true effect of demographic variables on first-term attrition.

The unrestricted model constructed by Jag indicated that increasing age was correlated with a higher likelihood of attrition. On the other hand, the restricted model showed that this effect was reversed once the first 90-days of service were controlled. Older recruits, who made it through initial training, were less likely to attrite than their younger counterparts.

Mehay and Arkes (2013) conducted a study that investigated the effects of home-state unemployment rates on attrition behavior of Navy enlistees, for successive career windows during the first-term of service. Analysis included the first six months, the second six months, the second year, and the third year of service. The results indicated that attrition is negatively associated with changes in the local unemployment rate during the first three career windows covering two years of service.

Their data set was drawn from Navy enlisted master files, and contained demographic information and service history on active-duty personnel who entered the Navy between 1999 and 2009. In their attrition model, they used the entry ages as demographic variables, in addition to economic variables. As a result, they learned that in the first six months and one year period, the older the enlistees in six month, the more likely to attrite. However, result was just the opposite for the other three terms. Older personnel were less likely to attrite in second six month, second year and third year periods.

Perger (2011) analyzed the effects of combat exposure on reenlistment attrition in his Master's Thesis. This study attempted to find a correlation between the battlefield experience and the retention and attrition decisions of first-term enlistees. Probit models were used to estimate effects. Age was also included in his models to estimate the true effect. Consequently, although the age variable has shown an insignificant effect on attrition and reenlistment for the Air Force, and the reenlistment model for Marine Corps and Army, it has had a significant effect on Navy attrition and reenlistment models, along with Marine Corps and Army attrition models.

Cox (2003) analyzes relationship between the size of the enlistment bonus offered for a recruit and the likelihood of the recruits' attrition. His study focuses on a subset of first-term enlistees with five- and six-year initial contract. The study estimates separate models for each year between 1993 and 1997. In his cross sectional analyses, he finds that age at the service entry is a statistically significant covariate. According to results of his study enlistees with five year contract are more likely to attrite when they get older one more year for the first year and less likely to attrite for the second year. The same effects are seen for the enlistees with six year contract in his survival analysis. However, Cox does not include six-month or forty-five month attrition in his analyses, and he only focuses on Navy enlistees.

Moore and Reese (2001) track the sailors "from street to fleet" analyzing the factors which influence their attrition behavior during initial skill training. Their study indicates that one of the determinants of attrition is age at the entry. Logit models are used in their analyses to determine the important predictors of the attrition. Results for his study about boot attrition and post boot attrition show that age at the entry is statistically significant. While it has a positive marginal effect, on average holding all else constant on boot camp attrition, it has negative marginal effect on post boot camp attrition. Although this study shows a similarity to our study in terms of including age at the entry in the Navy, it differs in not comparing enlistment ages between themselves for all forces (CNA, 2001).

Wenger and Hodari (2004) made a research to find out how non-cognitive factors affect attrition. They primarily focused on 36 months attrition rate by using large service-wide survey. According to this study, non-cognitive factors such as education credentials, smoking, marital status, expelling from a school have an effect on attrition. They also include the accession age in their regressions and find statistically significant results. Namely, all recruits who enlist before turning 18 have higher attrition rates, but enlistees with non-high school degree at age 20 or more have lower attrition rate than their younger colleagues. Their study does not include the age variable more than 23 separately. Furthermore, the attrition models are not conditional (CNA, 2004).

C. CONCLUSION

Though there are many parameters measuring the success in organizations, we have chosen attrition as the indicator of productivity in our study. We searched a great number of studies about first-term attrition rate; however, few studies taking the effect of entry age into account, especially the age-at-the-contract year (enlistment age) on productivity. In our study, we will focus on the effect of enlistment age on attrition in the first term for four armed forces.

This study focuses on providing beneficial information to the armed forces command to use in future recruitment systems from the enlistment age perspective.

III.   THE ENLISTMENT AGE POLICY

A.   INTRODUCTION

In this chapter, we will provide information about different enlistment age policies used in the past and the present. A historical part of this chapter focuses on three major armies: The Ottoman Army, The British Army, and The United States Army. Current enlistment age systems are explained in tables and summarized in this chapter. During the study, 175 countries were examined. A detailed table contains results is displayed in the Appendix.

B.   DIFFERENT ENLISTMENT AGE POLICIES IN THE HISTORY

Countries have armies for both peace and war time. Due to the probability of war, countries increase or decrease their military strength. There are different ways to improve the strength. One is to add more manpower. To raise the number of soldiers, countries usually modify their enlistment policies and decrease the enlistment age to enlarge applicant population. Following are historical examples for different enlistment policies:

- Between AD 600–1453 (Byzantine Empire), the minimum age for recruitment was 18 and the maximum was 40 (Haldon, 2002).

- During Napoleonic Wars in 1764, Russia prohibited enlisting any youth before age 15 (Mikaberidze, 2005).

- On June 14, 1775, the second continental congress formed the Continental Army, raising 22,000 troops from the Boston area, and 5,000 from New York. Of these troops, most had little training or military experience, and the minimum enlistment age was 16 (U.S. History, Volume I, 2013).

- In 1939, enlistment age limits for Australian Imperial Forces were 20–35, and in 1943, limits were 18–40. For the militia, the limits were extended to 18–60. This is a great example of how the enlistment age policy was being revised to increase the number of soldiers by decreasing minimum enlistment age, and increasing maximum age (Mitchell, 2013).

1. The Ottoman Empire

The Ottoman Army was one of the largest and the most powerful armies of its time. In order to sustain to this power, the Ottoman Army used different recruitment systems. One of the systems, the Pencik system, was used from 1363 until the 15th century. According to this system, the Army enlisted 20 percent of the prisoners of war (POWs) between the ages of 10 to 17-years-old. After the 15th century, Ottoman used the Devshirme System until the 17th century. Young Christian boys between 10 and 20 years old were enlisted accordingly. The boys were usually enlisted from Balkans; most of them accepted Islam.

After enacting the military service law in 1826, healthy and physically strong males between 15 and 40-years old were enlisted (Sakin, 2011). In 1846, the service law was changed, consequently males between 20- to 25-years-old were enlisted. In accordance with 1886 and 1908 laws, 18-year-old males were obligated to do compulsory military service (Yıldız, 2009).

Before WWI, the enlistment age was 18, due to increased manpower needs in the Army. Prior to this, the enlistment age was 20. During WWI, males between 18 and 45 were enlisted. In Dardanelles War, the need for soldiers was enormous, which prompted 15-year-old males to be enlisted to war.

After the Independence War in 1922, the need for soldiers was diminished. Hence, a new military service law was enacted in 1927, which increased the enlistment age to 20. The maximum compulsory military service age was 46 (Aslan, 2005).

2. The British Army

At the beginning of the 18th century, the strength of the British Army was cut off, and stood at 7,000 troops at home. After the Treaty of Ryswick, 14,000 soldiers were based overseas, with recruits ranging from 17 to 50 years of age. This situation remained the same until the start of WWI (Neuman & Brenner, 2001).

At the start of 1914, the British Army had a reported strength of 710,000 men including reserves—of which 247,432 were regular troops—and 80,000 regular troops formed as the British Expeditionary Force. The Military Service Bill, which determined that single men between 18 and 41 were liable to be called up for service, was put into effect. By the end of WWI, over five million men—nearly a quarter of the total male population of the United Kingdom of Great Britain and Ireland—had registered for the military (Chandler & Beckett, 2003).

In early 1939, Conscription was accepted to meet the threat of Germany, with the Military Training Act of April 27, 1939. This act required all men aged 20 and 21 to take six months of military training. This act was extended to include all fit men between the ages of 18 and 41 as the war continued (BBC, 2003).

3. The U.S. Army

Prior to 1862 in America, white men were required to attend local militia units, while combat duty was always voluntary. During the Civil War, both the North and South implemented the conscription, in order to meet their increasing military need. On April 16, 1862, the Confederate Congress passed an act requiring military service for three years from all males aged 18–35. In 1863, the Law of Congress extended the age range from 20 to 45 (Poinsett, 1840).

During WWI, Woodrow Wilson started to implement the Conscription after enacting the Selective Service Act of 1917. This law had determined that men between the ages of 21 and 31 would be called up for military service, and prohibited all forms of bounties, substitutions, or purchase of exemptions (Moore, 1924).

C. ENLISTMENT AGES FOR COUNTRIES TODAY

In this section, we provide some information about the current recruitment ages all over the World. In Table 2, different enlistment ages of the countries having voluntary and compulsory service and their frequency are listed. In Table 3, the enlistment age distribution among sixty counties both having compulsory and voluntary service is shown.

Table 2. Different Enlistment Ages and Numbers of the Countries

	ENLISTMENT AGE	NUMBERS OF COUNTRIES	PERCENTAGE
VOLUNTARY SERVICE (165 COUNTRIES)	16	14	8%
	16,5	1	1%
	17	23	14%
	17,5	2	1%
	18	**119**	**72%**
	19	3	2%
	20	3	2%
	21	0	0%
COMPULSORY SERVICE (70 COUNTRIES)	17	2	3%
	18	**56**	**80%**
	19	4	6%
	20	6	9%
	21	2	3%

Adapted from *The World Factbook*, 2013. Retrieved from https://www.cia.gov/library/publications/the-world-factbook/fields/print_2024.html

Table 3. Enlistment Age Distribution

COMPULSORY & VOLUNTARY SERVICE SYSTEMS (60 COUNTRIES)	ENLISTMENT AGE	NUMBERS OF COUNTRIES	PERCENTAGE
COMPULSORY SYSTEM	16	6	10%
	16,5	1	2%
	17	8	13%
	18	43	72%
	19	1	2%
	20	1	2%
	21	0	0%
VOLUNTARY SYSTEM	16	0	0%
	16,5	0	0%
	17	0	0%
	18	50	83%
	19	4	7%
	20	5	8%
	21	1	2%

There are three recruitment systems among 175 countries in the World. One of them is voluntary, another one is compulsory, and the last one is the system which contains both compulsory and voluntary recruitment at the same time. Sixty percent of the countries have voluntary systems, 6 percent have compulsory systems, and 34 percent have both systems. As seen in Table 2, 119 countries having voluntary systems are recruiting at the age of 18, which compose 72 percent of the voluntary systems, among 165 countries. Fifty-six countries have compulsory services and are recruiting at the age of 18, which constitutes 80 percent of the compulsory system among 70 countries (Central Intelligence Agency, 2013).

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IV. DATA

A. INTRODUCTION

This chapter discusses the data source and defines the dependent and independent variables used in the regression.

B. DATA DESCRIPTION

We acquired the data for our study from the Defense Manpower Data Center (DMDC). The data belongs to soldiers and enlistees who have been followed between the years of 1995 and 2013. It includes cohorts from three different year periods. Cohort 1 covers the data of Fiscal Years 1995 and 1999. Cohort 2 is tracked between 2000 and 2012; Cohort 3 was monitored in 2013. These three files have been merged into Stata (a kind of statistical program) to analyze the continuous first-term attrition decisions of the enlistees. The annual state unemployment rate was added to increase the accuracy of the models.

The first raw data file involved 3,545,241 observations, and 17 data variables. The data elements consisted of personal demographics and military background information, such as SSN Number, date of birth, gender, race, accession date, separation date, education level, marital status, character of service (COS), Inter-service separation Code (ISC), AFQT score and category, military service, and ethnicity. Records having separation dates earlier than the accession date were dropped, and enlistees older than 42-years-old, and younger than 17-years-old. Additionally, third gender categories and Coast Guard service "H" categories were extracted from our data. Because we wanted to only follow attrition decisions of enlistees, 221,983 records belonging to officers were removed from the sample. Before studying our model, in the first phase, 368,137 observations were deleted, in order to clean and harmonize our data. In the second phase, we balanced our data to determine the six-month attrition. In 2013, enlistees having accession dates after March 30, 2013, and a missing separation date (because these samples do not have enough time to follow all

possible outcomes) were struck out. For the next phases we repeated the same extraction for 12-month attrition rates (September 30, 2012), 24-month attrition rates (September 30, 2011), and 45-month attrition rates (December 30, 2009). Ultimately, we calculated 3,177,104 for the six-month regression.

C. SAMPLE

1. Sample Characteristics

Our data includes both non-prior service (NPS) and prior service (PS) enlistees, that's why the average values of the characteristics, especially age and marital status, represent the average values of only NPS enlistees (Bureau of Labor Statistics,2011).

Figure 1 shows prior service accession rates between the fiscal years of 1997 and 2009 for each service. Regarding to these statistics, on average, 5 percent of the enlistees in DOD have prior service, while this ratio has an uneven distribution among four forces. For instance, it is 10 percent for the Army, 2 percent for the Navy and Marine Corps, and the Air Force has the lowest prior service enlistment, with 1 percent.
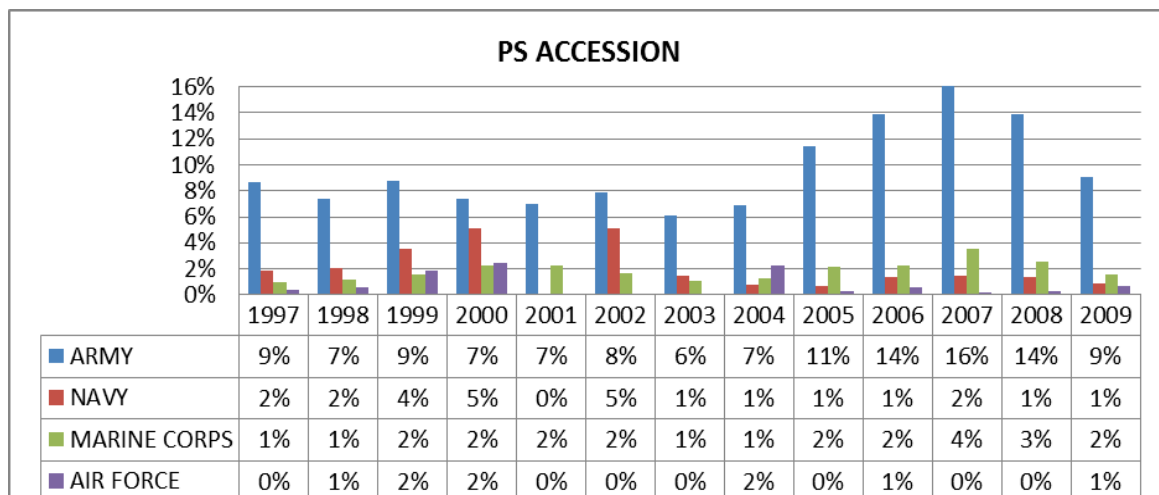
PS ACCESSION

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
ARMY	9%	7%	9%	7%	7%	8%	6%	7%	11%	14%	16%	14%	9%
NAVY	2%	2%	4%	5%	0%	5%	1%	1%	1%	1%	2%	1%	1%
MARINE CORPS	1%	1%	2%	2%	2%	2%	1%	1%	2%	2%	4%	3%	2%
AIR FORCE	0%	1%	2%	2%	0%	0%	0%	2%	0%	1%	0%	0%	1%

Adapted from "Population Representation in the Military Services." Retrieved from http://prhome.defense.gov

Figure 1.   Prior Service Enlistment Rates for Services (1997–2009)

In addition to the statistics mentioned previously, Figure 2 and Figure 3 show the age distribution of the prior service enlistees by gender. In Figure 2 and Figure 3, most of the prior service enlisted personnel, in all services, are 25 years and above at entry. These statistics support our results.
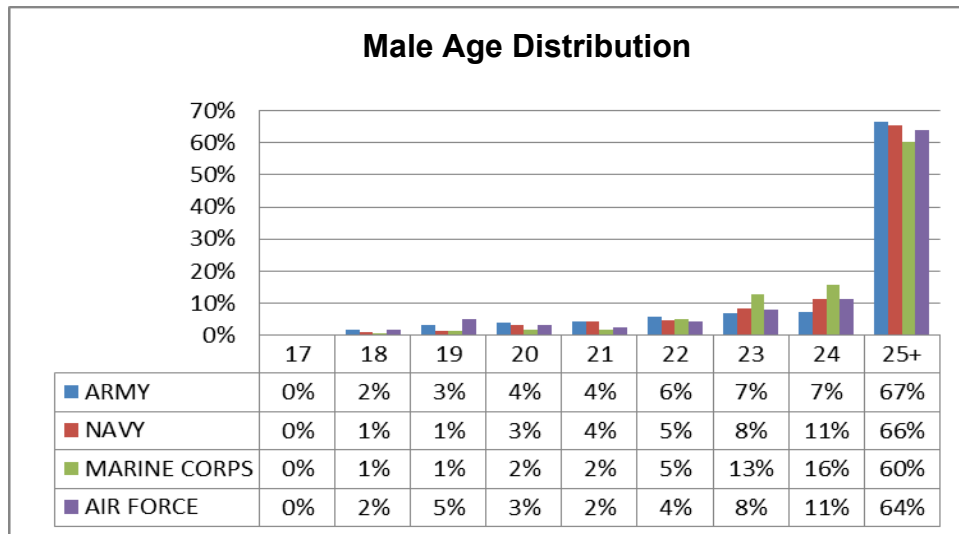
Male Age Distribution

	17	18	19	20	21	22	23	24	25+
ARMY	0%	2%	3%	4%	4%	6%	7%	7%	67%
NAVY	0%	1%	1%	3%	4%	5%	8%	11%	66%
MARINE CORPS	0%	1%	1%	2%	2%	5%	13%	16%	60%
AIR FORCE	0%	2%	5%	3%	2%	4%	8%	11%	64%

Adapted from "Population Representation in the Military Services." Retrieved from http://prhome.defense.gov

Figure 2.   Male Prior Service Enlistment Age Distribution
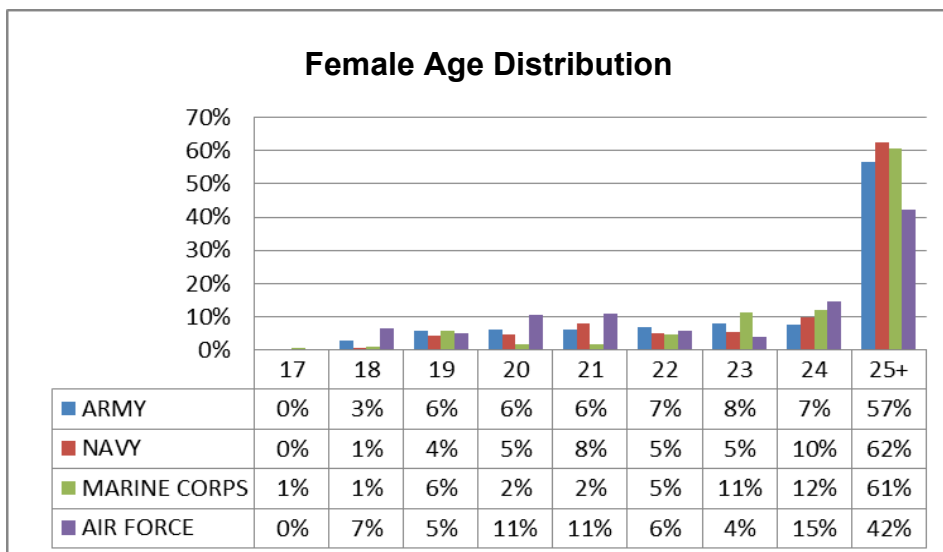
Female Age Distribution

	17	18	19	20	21	22	23	24	25+
ARMY	0%	3%	6%	6%	6%	7%	8%	7%	57%
NAVY	0%	1%	4%	5%	8%	5%	5%	10%	62%
MARINE CORPS	1%	1%	6%	2%	2%	5%	11%	12%	61%
AIR FORCE	0%	7%	5%	11%	11%	6%	4%	15%	42%

Adapted from "Population Representation in the Military Services." Retrieved from http://prhome.defense.gov

Figure 3.   Female Prior Service Enlistment Age Distribution

2. Descriptive Statistics

Table 4 and Table 5 provide summary statistics of the enlisted attrition dataset used to estimate the parameters for two models. As shown in both tables, the predominant enlistment age is 18, which is true for all forces. This includes 18 percent for the Army and Navy, and 29 percent for Air Force and Marine Corps.

The average age of an entrant for the Army is 22.4, for Navy 23.96, for Air Force 19.8, for Marine Corps, 19.99. Female enlistees are accounted for 16 percent for Army, 14 percent for Navy, 23 percent for Air Force, and 7 percent for Marine Corps.

The marriage rate for the Army is 28.8 percent, 30.8 percent for the Navy 30.8, 10.4 for the Air Force, and 10.8 percent for the Marine Corps. As can be seen in Table 3, these numbers are higher than the expected average number in that people are monitored throughout their military service. Thus, the marriage rate should be higher, since people tend to get married as their career progresses.

Table 4. Non-Prior Service (NPS) Active Component Enlisted
Accessions Percent Married by Service FYs 1995–2011

YEARS	ARMY	NAVY	MARINE CORPS	AIR FORCE
1995	14.5	4.9	4.1	11
1996	14.6	5.1	4.2	10.7
1997	15.9	5.2	4.2	10
1998	14.4	5.2	4.3	9.3
1999	14	6.1	3.9	9.7
2000	13.2	6	3.3	8.6
2001	12.9	5.7	3.1	9.2
2002	13.8	6	3	9.2
2003	13.6	5.5	4.6	8.6
2004	13.5	5.2	2.4	8.4
2005	14.2	5.1	2.6	8.4
2006	14.8	5.7	2.7	8.6
2007	16.2	6.4	3	8.9
2008	22.9	1.7	3.2	10.7
2009	18.3	2.1	3.3	11.7
2010	17.7	4.5	2.6	11.2
2011	16	4.9	2.1	10.3
Average %	15.32	5.02	3.33	9.68

Adapted from "Population Representation in the Military Services." Retrieved from http://prhome.defense.gov

Table 5. Descriptive Statistics of Army and Navy

	ARMY(n=1,543,047)			NAVY(n=458,718)		
		Mean	Std. Dev.		Mean	Std. Dev.
Overall attrition in 6 months	n=1,528,537	0.0675	0.2509	n=458,099	0.0995	0.2994
Overall attrition in 12 months	n=1,399,181	0.0466	0.2109	n=411,653	0.0374	0.1896
Overall attrition in 24 months	n=1,307,633	0.0874	0.2825	n=391,381	0.0675	0.2509
Overall attrition in 45 months	n=921,229	0.2895	0.4535	n=357,242	0.1369	0.3438
Character disorder attrition in 6 months	n=1,528,537	0.0008	0.0275	n=458,099	0.0009	0.0301
Character disorder attrition in 12 months	n=1,399,181	0.0034	0.0584	n=411,653	0.0029	0.0538
Character disorder attrition in 24 months	n=1,307,633	0.0131	0.1136	n=391,381	0.0077	0.0875
Character disorder attrition in 45months	n=921,229	0.0270	0.1620	n=357,242	0.0146	0.1198
ENLISTMENT AGES						
age17		0.0750	0.2634		0.0339	0.1809
age18		0.1812	0.3852		0.1894	0.3918
age19		0.1397	0.3467		0.1339	0.3405
age20		0.0976	0.2968		0.0799	0.2711
age21		0.0791	0.2699		0.0583	0.2343
age22		0.0656	0.2475		0.0551	0.2281
age23		0.0548	0.2275		0.0481	0.2141
age24		0.0458	0.2091		0.0417	0.1999
age25		0.0383	0.1919		0.0335	0.1798
age26_27		0.0590	0.2355		0.0565	0.2309
age28_29		0.0438	0.2045		0.0522	0.2223
age30_34		0.0750	0.2633		0.1234	0.3289
age35_42		0.0453	0.2079		0.0942	0.2922
age		22.4504	5.3227		23.9633	6.3877
TIS		1669.4400	1373.1710		2092.0930	1614.1280
female		0.1673	0.3732		0.1412	0.3482
cat1		0.0528	0.2237		0.0470	0.2117
cat2		0.2615	0.4395		0.3322	0.4710
cat3		0.4861	0.4998		0.5124	0.4998
cat4		0.0255	0.1577		0.0271	0.1622
cat5		0.0000	0.0053		0.0000	0.0026
cat_unknown		0.1740	0.3791		0.0813	0.2733

	ARMY(n=1,543,047)		NAVY(n=458,718)	
	Mean	Std. Dev.	Mean	Std. Dev.
MARITAL STATUS				
other_marital status	0.0248	0.1556	0.0003	0.0161
married	0.2883	0.4530	0.3081	0.4617
single	0.6850	0.4645	0.6868	0.4638
mar_stat_unknown	0.0018	0.0425	0.0048	0.0689
EDUC_LEVEL	21.8727	5.4897	20.9491	4.2068
some_college (no diploma)	0.0402	0.1965	0.0154	0.1230
some high school(no diploma)	0.0195	0.1381	0.0251	0.1566
High school degree	0.7638	0.4248	0.8994	0.3008
education unknown	0.0513	0.2205	0.0101	0.1001
alternate education	0.0761	0.2652	0.0302	0.1710
college_degree	0.0368	0.1882	0.0181	0.1332
doctorate,master and above	0.0123	0.1104	0.0018	0.0422
RACE				
black	0.2320	0.4221	0.2087	0.4064
white	0.6898	0.4626	0.6939	0.4609
race_unknown	0.0108	0.1035	0.0060	0.0775
race_others	0.0233	0.1507	0.0103	0.1008
hispanic	0.0441	0.2053	0.0811	0.2730
hispan_95_99	0.0441	0.2053	0.0811	0.2730
CHARACTER OF SERVICE				
cos_missing	0.2140	0.4101	0.3792	0.4852
badconduct	0.0012	0.0352	0.0043	0.0653
honorable	0.4276	0.4947	0.4871	0.4998
uncharacterized	0.0811	0.2730	0.0096	0.0975
under_honorable	0.0761	0.2652	0.0516	0.2212
cos_unknown	0.1999	0.3999	0.0683	0.2522
character disorder	0.0424	0.2015	0.0363	0.1870

Table 6. Descriptive Statistics of Air Force and Marine Corps

	AIRFORCE(507,496)			MARINE CORPS(667,843)		
		Mean	Std. Dev.		Mean	Std. Dev.
Overall attrition in 6 months	n=495,783	0.0970	0.2960	n=664,392	0.0676	0.2510
Overall attrition in 12 months	n=434,970	0.0335	0.1800	n=606,253	0.0418	0.2002
Overall attrition in 24 months	n=394,576	0.0597	0.2369	n=566,072	0.0560	0.2298
Overall attrition in 45 months	n=232,927	0.1749	0.3799	n=412,797	0.1148	0.3187
Character disorder attrition in 6 months	n= 495,783	0.0153	0.1225	n=664,392	0.0009	0.0293
Character disorder attrition in 12 months	n=434,970	0.0050	0.0704	n=606,253	0.0054	0.0736
Character disorder attrition in 24 months	n=394,576	0.0103	0.1011	n=566,072	0.0145	0.1194
Character disorder attrition in 45months	n=232,927	0.0197	0.1391	n=412,797	0.0311	0.1736
ENLISTMENT AGES						
age17		0.0406	0.1973		0.1842	0.3877
age18		0.2961	0.4565		0.2958	0.4564
age19		0.2301	0.4209		0.1704	0.3760
age20		0.1446	0.3517		0.0912	0.2878
age21		0.0931	0.2906		0.0594	0.2363
age22		0.0658	0.2480		0.0456	0.2086
age23		0.0452	0.2078		0.0327	0.1778
age24		0.0315	0.1746		0.0233	0.1507
age25		0.0211	0.1438		0.0171	0.1297
age26_27		0.0264	0.1603		0.0235	0.1515
age28_29		0.0030	0.0547		0.0133	0.1146
age30_34		0.0021	0.0459		0.0242	0.1537
age35_42		0.0003	0.0186		0.0194	0.1378
age		19.8740	2.2950		19.9991	3.9565
TIS		1,438.8840	1,162.2200		1,595.4690	1,091.7350
female		0.2331	0.4228		0.0728	0.2598
cat1		0.0241	0.1534		0.0356	0.1854
cat2		0.1795	0.3838		0.2908	0.4541
cat3		0.1928	0.3945		0.4631	0.4986
cat4		0.0006	0.0241		0.0079	0.0887
cat5		0.0000	0.0000		0.0000	0.0030
cat_unknown		0.6030	0.4893		0.2025	0.4019

	AIRFORCE(507,496)		MARINE CORPS(667,843)	
	Mean	Std. Dev.	Mean	Std. Dev.
MARITAL STATUS				
other_marital status	0.0048	0.0688	0.0097	0.0978
married	0.1047	0.3062	0.1081	0.3105
single	0.8903	0.3125	0.8823	0.3223
mar_stat_unknown	0.0002	0.0154	0.0000	0.0039
EDUC_LEVEL	21.6610	5.3148	21.7189	3.0238
some_college (no diploma)	0.0441	0.2054	0.0112	0.1054
some high school(no diploma)	0.0033	0.0573	0.0044	0.0665
High school degree	0.8704	0.3358	0.9278	0.2588
education unknown	0.0648	0.2462	0.0132	0.1139
alternate education	0.0066	0.0812	0.0318	0.1756
college_degree	0.0083	0.0905	0.0078	0.0882
doctorate,master and above	0.0024	0.0491	0.0036	0.0602
RACE				
black	0.1585	0.3652	0.1154	0.3195
white	0.7504	0.4328	0.7785	0.4153
race_unknown	0.0191	0.1369	0.0440	0.2052
race_others	0.0430	0.2028	0.0234	0.1510
hispanic	0.0291	0.1681	0.0387	0.1929
hispan_95_99	0.0291	0.1681	0.0387	0.1929
CHARACTER OF SERVICE				
cos_missing	0.2247	0.4174	0.1567	0.3635
badconduct	0.0043	0.0652	0.0162	0.1262
honorable	0.3333	0.4714	0.4719	0.4992
uncharacterized	0.0517	0.2215	0.0565	0.2308
under_honorable	0.0549	0.2278	0.0648	0.2461
cos_unknown	0.3311	0.4706	0.2340	0.4234
character disorder	0.0416	0.1997	0.0484	0.2146

3.   Dependent Variables

a.   *Attrition*

The dependent variable 'attrite' indicates whether enlistees continued to work in their current unit, whether they decided to quit, or were discharged from the service. Attrite6, Attrite12, Attrite24, and Attrite45 each generated data to follow enlistees` decisions during their first term. Our main purpose is to find a pattern between age variable, which has been generated as a dummy and first-term attrition rate.

b.   *Attrition Character Disorder*

This variable tries to explain the probability of attrition based on character disorder. Character disorder variable was generated by using ISC and then it was interacted with attrition variable for four terms.

4.   Independent Variables

a.   *Demographics*

Gender, age, marital status, and race are the demographic variables that are used in our model as a predictor of attritions. This thesis is trying to determine whether any of these variables has any effect on individual early separation from U.S. military.

b.   *Gender*

Gender variables in our study were generated as a binary by removing some individuals having unknown sex characteristics. Previous studies about attrition have shown that women's attrition rate were higher than men's. This thesis also includes the comparison of first term attrition rate for four services regarding their gender characteristics. Gender-related attrition studies will help policy makers to make better decisions.

c.   Race

In this data set, DMDC data has provided six different race categories, including Hispanics, Asian, Black, White, American/Indian, and mixed race. We have regrouped them as Black, White, Hispanic, Other, and unknown, in order to sharpen our focus in the study. Since only files 1995–1999 included the Hispanic race, we created a dummy variable, FY95–99, to interact with the Hispanic. Although the race category of approximately 2.5 percent enlistee's is unknown, we maintained those files from which to study aged-related attrition rates.

d.   Age

The age variable is the most important independent binary variable that can be used as a predictor in our study. DMDC raw data has not included the age variable, so we generated it from the given birth date variable. We dropped ages older than 42 and younger than 17. We regrouped the older ages into four categories (age 26–27, age 28–29, age 30–34, and age 35–42) to gain reasonable results.

e.   Marital Status

Marital status can be used a predictor variable for the studies of attrition, and has an effect on first-term attrition rate. Raw data included single, married, annulled, divorced, interlocutory, widowed, and unknown. We have regrouped the marital status characteristics into the following four categories: married, single, other, and unknown.

5.   Enlistment Characteristics

In this thesis, the following characteristics will be examined: Armed Forces Qualification Test (AFQT) score and characteristics, level of education, home state of the enlistees and its corresponding unemployment rate, inter-service separation code, and the year the enlistee registered for the service. These variables can be used to predict the attrition rate.

a. Armed Forces Qualification Test and Categories (AFQT CAT)

DMDC raw data consisted of three separate year cohorts and different characteristics of individuals including AFQT scores. Some individuals in different years do not have AFQT scores, but instead, have categories. Some data was mistakenly written as "0" belonging to over thirty percent of individuals. AFQT Categories are coded for each individual correctly, with no missing values. We have decided to use AFQT CAT instead of AFQT scores, and have thus merged AFQT characteristics into six categories: CAT I, CAT II, CAT III, CAT IV, CAT V, and unknown.

b. Education

An individual's education level is another important variable to examine in attrition models. According to previous studies, individuals having a high school diploma have a higher probability of remaining in the United States military than individuals without a high school diploma. To define the educational level of enlistees, we have created six different education characteristics, including: some high school education, high school diploma, some college education, college degree, alternate education, education level unknown, Master and Doctorate degrees and above.

c. Home States

Different geographic regions throughout the U.S. might show different unemployment rates. Because this thesis attempts to find a trend between an individual's enlistment age and first-term attrition rates, other variables and effective factors are taken into consideration to minimize any bias. Home states are used to give the true rate of age on first-term attrition. This thesis contains 70 states, including U.S.-administered islands and unknown category.

d. Unemployment Rate

The unemployment rate might also be an element that affects the first-term attrition behavior of individuals. Because every state has different unemployment rates at different times, individuals were matched with their home states and corresponding unemployment rate. Home state unemployment rates were taken from the Bureau of Labor Statistics. The data was collected to show the monthly unemployment rate for every state from FY 1994 through 2013. Data belonging to years 1994–1999 was not in table format, but rather in text format. It was then converted to table format row-by-row.

e. Inter-service Separation Code

The inter-service separation code is a DMDC generated code standardized across services. It shows how and why an enlistee separated from the service. We have generated a binary variable that explains whether the individual has left due to character disorders, and have recoded these variable characteristics, and created char_disorder, which forms 4 percent of all data. In our second model, we attempt to investigate the relations between attrition and character disorder. We considered "Character or behavior disorder," "Motivational problems (apathy)," "Alcoholism," "Discreditable incidents, civilian or military," "Shirking," "Drugs" as a character disorder.

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V.   METHODOLOGY AND RESULTS

A.   INTRODUCTION

This chapter explains the methodology for estimating the models for attrition.

B.   RESEARCH DESIGN

This study uses two probit analyses to examine attrition rates for four-time intervals that include the first six months, 6–12 months, 12–24 months, and 24–45 months. One model analyzes the attrition rates for given periods, and the second model explains the probability of attrition based on character disorders. We created character disorder variable by using the inter-service separation code (ISC), and interacted with attrition dummies for each period. Finally, this study contains two different models and eight different regressions for each service.

In order to minimize biasness that can be caused by absent year-specific factors, year dummy variables for each fiscal year and month dummies representing enlistment months were generated. In our attempt to increase the accuracy of the models, we included the annual state unemployment rate and state dummies.

Following categories are the reference categories for the probit analysis;
- White
- Year 1994
- Male
- State of Alabama
- CAT I
- Single
- Some High School
- Age 17

C.   THEORETICAL FRAMEWORK

1.   Model Specification

We used the following probit model to predict the effect of enlistment ages on attrition.

D.   RESULTS

This section describes the results of two probit models for four forces. The results are shown according to following order: Army, Navy, Air Force, and Marine Corps.

$$Y_{it} = \beta' X_{it} + \gamma' Age_{it} + \sum \partial_t T_t + \varepsilon_{it}$$

Y_{it} is the attrition indicator for enlistee i with the entry year t. X_{it} is the set of demographics and military factors explained below. T_t is the indicator variable for year t.

- $SomeHS_{it}$ is a dummy variable equal to 1 if enlistee i has some level of high school education, but not a high school diploma and zero, otherwise at the time of t.

- $SomeCollege_{it}$ is a dummy variable equal to 1 if enlistee i had attained college credit prior to enlistment, but not college degree, and zero otherwise at the time of t.

- $CollegeDegree_{it}$ is a dummy variable equal to 1 if enlistee i has college degree, and zero otherwise at the time of t.

- $Alternate\ Education_{it}$ is a dummy variable equal to 1 if enlistee i has an alternate education, and zero otherwise at the time of t.

- $Master\_Doctor\_above\ Degree_{it}$ is a dummy variable equal to 1 if enlistee i has master, doctorate degree, or above, and zero otherwise at the time of t.

- $Single_{it}$ is a dummy variable equal to 1 if enlistee i is single, and zero otherwise.

- $Mar\_Status\_Unknown_{it}$ is a dummy variable equal to 1 if enlistee i has not been a known marital status, and zero otherwise.

- $Other\_Mar\_Status_{it}$ is a dummy variable equal to 1 if enlistee i is legally separated, divorced, annulled, and otherwise 0

- *White$_{it}$* is a dummy variable equal to 1 if enlistee i is white, and zero if otherwise.

- *Race_Unknown$_{it}$* is a dummy variable equal to 1 if enlistee i has an unknown race, and zero if otherwise.

- *Hispan_95_99$_{it}$* is an interacted dummy equals to 1 if enlistee i is Hispanic and he/she was enlisted between 94 to 99, and zero if otherwise.

- *OtherRace$_{it}$* is a dummy variable equal to 1 if enlistee i has a race other than white and black, and otherwise zero.'

We have created the following dummies to define AFQT categories:

- *Cat1$_{it}$* is 1 if enlistee i's percentile score on the Armed Forces Qualification Test is between range of 93–99 at the time of t, or zero if otherwise.

- *Cat2$_{it}$* is 1 if enlistee i's percentile score on the Armed Forces Qualification Test is between range of 65–92 at the time of t, or zero if otherwise.

- *Cat3$_{it}$* is 1 if enlistee i's percentile score on the Armed Forces Qualification Test is between range of 31–64 at the time of t, or zero if otherwise.

- *Cat4$_{it}$* is 1 if enlistee i's percentile score on the Armed Forces Qualification Test is between range of 10–30 at the time of t, or zero if otherwise.

- *Cat5$_{it}$* is 1 if enlistee i's percentile score on the Armed Forces Qualification Test is between range of 0–9 at the time of t, or zero if otherwise.

- Cat_*Unknown$_{it}$* is 1 if enlistee i's percentile score on the Armed Forces Qualification Test is unknown at the time of t, or zero if otherwise.

- *Female$_{it}$* is a dummy variable equal to 1 if enlistee i is female, and zero if otherwise.

- *unemployment$_{it}$* is a continuous variable that is based on enlistee i's home state of residence at the time of entry.

- *Home_state$_{it}$* is a dummy that shows the enlistee i's home state when he is enlisted.

- *Age$_{it}$* measures the structural changes over the course of study. It includes year and month dummies for accession date.

- $X_{i,t}$ defines enlistee i's enlistment age that is of particular interest to this study. We consider age variable in a range of minimum 17 years and maximum 42 years at the time of t.

- The coefficients χ is the parameter of interest from the model above. The coefficient χ represents the effect of enlistment age on the probability of attrition in the first term.

- ε_{it} is the error term.

Table 7. Army Attrition Rates by Recruit Characteristics

ARMY-M1	Attrition in 6 months	Attrition in the second 6 months	Attrition in the second year	Attrition in 45 months
Enlistment Ages(age 17 is the reference category)				
age18	0.0379***	0.0069***	-0.0103***	0.0557***
	(0.0011)	(0.0007)	(0.0010)	(0.0024)
age19	0.0509***	0.0075***	-0.0071***	0.0722***
	(0.0013)	(0.0008)	(0.0010)	(0.0025)
age20	0.0504***	0.0069***	-0.0087***	0.0619***
	(0.0014)	(0.0008)	(0.0011)	(0.0027)
age21	0.0399***	0.0038***	-0.0117***	0.0514***
	(0.0014)	(0.0009)	(0.0011)	(0.0028)
age22	0.0300***	0.0017*	-0.0138***	0.0462***
	(0.0014)	(0.0009)	(0.0012)	(0.0029)
age23	0.0244***	-0.0014	-0.0149***	0.0367***
	(0.0014)	(0.0009)	(0.0012)	(0.0030)
age24	0.0164***	-0.0017*	-0.0141***	0.0299***
	(0.0014)	(0.0010)	(0.0013)	(0.0031)
age25	0.0134***	-0.0021**	-0.0140***	0.0058*
	(0.0015)	(0.0011)	(0.0014)	(0.0032)
age26_27	0.0051***	-0.0056***	-0.0218***	-0.0159***
	(0.0013)	(0.0009)	(0.0012)	(0.0028)
age28_29	0.00139	-0.0072***	-0.0252***	-0.0501***
	(0.0013)	(0.0010)	(0.0012)	(0.0029)
age30_34	-0.0127***	-0.0115***	-0.0412***	-0.0933***
	(0.0010)	(0.0008)	(0.0010)	(0.0024)
age35_42	-0.0346***	-0.0083***	0.0023	0.0985***
	(0.0009)	(0.0010)	(0.0016)	(0.0035)
Education category(CAT I is the reference category)				
cat2	0.0058***	0.0052***	0.0124***	0.0028
	(0.0010)	(0.0009)	(0.0014)	(0.0024)
cat3	0.0166***	0.0088***	0.0200***	0.0419***
	(0.0010)	(0.0009)	(0.0013)	(0.0023)
cat4	0.0168***	0.0049***	0.0146***	0.0596***
	(0.0020)	(0.0016)	(0.0022)	(0.0039)
cat5	0.0628	-0.0046	-0.0374	-0.0344
	(0.0647)	(0.0336)	(0.0400)	(0.0999)
cat_unknown	0.0622***	0.0250***	0.0563***	0.1230***
	(0.0022)	(0.0017)	(0.0025)	(0.0039)
ARMY-M1	Attrition in 6 months	Attrition in the second 6 months	Attrition in the second year	Attrition in 45 months
Marital Status(single is the reference category)				
other_mar_stat	0.0119***	0.0057***	0.0051***	-0.0144***
	(0.0015)	(0.0013)	(0.0017)	(0.0031)
married	-0.0087***	-0.0043***	-0.0018***	-0.0442***

ARMY-M1	Attrition in 6 months	Attrition in the second 6 months	Attrition in the second year	Attrition in 45 months
	(0.0005)	(0.0005)	(0.0007)	(0.0013)
mar_stat_unknown	0.1160***	0.0141***	0.0123*	-0.0084
	(0.0071)	(0.0048)	(0.0065)	(0.0112)
Education Credential(some high school(no diploma) is the reference category)				
some_college(no diploma)	-0.0198***	-0.00855***	-0.0196***	-0.0464***
	(0.0011)	(0.0013)	(0.0018)	(0.0038)
High school degree	-0.0334***	-0.0106***	-0.0180***	-0.0385***
	(0.0014)	(0.0013)	(0.0018)	(0.0034)
educ_unknown	-0.0122***	-0.0072***	-0.0068***	-0.0297***
	(0.0012)	(0.0013)	(0.0019)	(0.0038)
alternative education	0.0048***	0.0072***	0.0245***	0.0607***
	(0.0014)	(0.0015)	(0.0022)	(0.0041)
college_degree	-0.0272***	-0.0177***	-0.0395***	-0.0633***
	(0.0010)	(0.0010)	(0.0015)	(0.0038)
doctorate, master and above	-0.0148***	-0.0128***	-0.0289***	-0.0430***
	(0.0017)	(0.0014)	(0.0022)	(0.0057)
Race(white is the reference category)				
black	-0.0257***	-0.0142***	-0.0149***	-0.0294***
	(0.0004)	(0.0004)	(0.0006)	(0.0013)
race_unknown	-0.0173***	-0.0078***	-0.0259***	-0.0017
	(0.0014)	(0.0014)	(0.0019)	(0.0044)
race_others	-0.0122***	-0.0071***	-0.0159***	-0.0128***
	(0.0012)	(0.0010)	(0.0016)	(0.0040)
hispan_95_99	-0.0201***	-0.0106***	-0.0149***	-0.0206***
	(0.0008)	(0.0008)	(0.0011)	(0.0021)
Other				
unemployment	-0.0001	-0.0003**	-0.0005***	0.0002
	(0.0001)	(0.0001)	(0.0002)	(0.0004)
female	0.0529***	0.0402***	0.0561***	0.0397***
	(0.0007)	(0.0006)	(0.0008)	(0.0014)
Observations	1,528,409	1,398,758	1,307,042	910,978

Note: All rates are conditional attrition rates.*p<0.10;**p<0.05;***p<0.01

ARMY-M2	Attrition based on character disorder in 6 months	Attrition based on character disorder in the second 6 months	Attrition based on character disorder in the second year	Attrition based on character disorder in 45 months
Enlistment Ages(age 17 is the reference category)				
age18	0.0005***	0.0010***	0.0011***	-0.0008**
	(0.0001)	(0.0002)	(0.0002)	(0.0003)
age19	0.0006***	0.0018***	0.0014***	-0.0018***
	(0.0001)	(0.0002)	(0.0003)	(0.0003)
age20	0.0008***	0.0015***	0.0005*	-0.0024***
	(0.0002)	(0.0002)	(0.0003)	(0.0003)
age21	0.0006***	0.0011***	-0.0001	-0.0042***
	(0.0002)	(0.0002)	(0.0003)	(0.0003)
age22	0.0005***	0.0012***	-0.0008***	-0.0048***
	(0.0002)	(0.0003)	(0.0003)	(0.0003)
age23	0.0008***	0.0008***	-0.0011***	-0.0054***
	(0.0002)	(0.0003)	(0.0003)	(0.0004)
age24	0.0007***	0.0012***	-0.0017***	-0.0058***
	(0.0002)	(0.0003)	(0.0003)	(0.0004)
age25	0.0006***	0.0016***	-0.0009**	-0.0069***
	(0.0002)	(0.0004)	(0.0004)	(0.0004)
age26_27	0.0009***	0.0013***	-0.0032***	-0.0075***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)
age28_29	0.0012***	0.0009**	-0.0028***	-0.0086***
	(0.0003)	(0.0004)	(0.0003)	(0.0003)
age30_34	0.0001***	0.0009***	-0.0040***	-0.0101***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)
age35_42	0.0005	-0.0010***	-0.0053***	-0.0117***
	(0.0003)	(0.0003)	(0.0003)	(0.0002)
Education category(CAT I is the reference category)				
cat2	0.0002*	0.0012***	0.0032***	0.0034***
	(0.0001)	(0.0003)	(0.0006)	(0.0008)
cat3	0.0003**	0.0013***	0.0050***	0.0058***
	(0.0001)	(0.0003)	(0.0005)	(0.0007)
cat4	0.0002	0.0011**	0.0039***	0.0050***
	(0.0002)	(0.0005)	(0.0009)	(0.0012)
cat5		0.0223		
		(0.0256)		
cat_unknown	0.0010***	0.0036***	0.0127***	0.0180***
	(0.0003)	(0.0006)	(0.0011)	(0.0015)

Note: All rates are conditional attrition rates.*p<0.10;**p<0.05;***p<0.01

ARMY-M2	Attrition based on character disorder in 6 months	Attrition based on character disorder in the second 6 months	Attrition based on character disorder in the second year	Attrition based on character disorder in 45 months
Marital Status(single is the reference category)				
other_mar_stat	-0.0001	-0.0002	0.0001	-0.0009
	(0.0001)	(0.0003)	(0.0005)	(0.0008)
married	-0.0002***	-0.0012***	-0.0029***	-0.0040***
	(0.0000)	(0.0001)	(0.0002)	(0.0003)
mar_stat_unknown	0.0002	0.0013	-0.0002	-0.0027
	(0.0005)	(0.0014)	(0.0018)	(0.0023)
Education Credential(some high school(no diploma) is the reference category)				
some_college(no diploma)	-0.0001	0.0005	-0.0008	-0.0024***
	(0.0001)	(0.0004)	(0.0005)	(0.0007)
High school degree	-0.0004**	-0.00003	-0.0021***	-0.0046***
	(0.0001)	(0.0003)	(0.0005)	(0.0007)
educ_unknown	-0.0002**	0.0004	0.0008	-0.0005
	(0.0001)	(0.0004)	(0.0005)	(0.0007)
alternative education	0.0001	0.0026***	0.0053***	0.0060***
	(0.0001)	(0.0006)	(0.0007)	(0.0009)
college_degree	-0.0004***	-0.0016***	-0.0052***	-0.0096***
	(0.0000)	(0.0002)	(0.0003)	(0.0003)
doctorate, master and above	-0.0003***	-0.0010***	-0.0037***	-0.0077***
	(0.0001)	(0.0003)	(0.0004)	(0.0006)
Race(white is the reference category)				
black	-0.0002***	-0.0003***	0.0020***	0.0083***
	(0.0000)	(0.0001)	(0.0002)	(0.0003)
race_unknown	-0.0002***	-0.0007***	-0.0021***	-0.0019**
	(0.0001)	(0.0002)	(0.0004)	(0.0007)
race_others	-0.0001*	-0.0005***	-0.0014***	-0.0029***
	(0.0001)	(0.0002)	(0.0004)	(0.0005)
hispan_95_99	-0.0001	-0.0012***	-0.0012**	-0.0004
	(0.0001)	(0.0002)	(0.0005)	(0.0007)
Other				
unemployment	-0.00001	-0.00001	-0.00001	-0.00001
	(0.0000)	(0.0000)	(0.0000)	(0.0001)
female	0.00007	0.0002*	-0.0017***	-0.0066***
	(0.0000)	(0.0001)	(0.0002)	(0.0002)
Observations	996,603	1,030,066	1,060,680	818,168

Note: All rates are conditional attrition rates.*p<0.10;**p<0.05;***p<0.01

Table 8. Navy Attrition Rates by Recruit Characteristics

NAVY-M1	Attrition in 6 months	Attrition in the second 6 months	Attrition in the second year	Attrition in 45 months
Enlistment Ages(age 17 is the reference category)				
age18	0.0022	-0.0036***	-0.0072***	-0.0089***
	(0.0019)	(0.0011)	(0.0019)	(0.0033)
age19	0.0209***	-0.0018	-0.0026	-0.0002
	(0.0023)	(0.0012)	(0.0021)	(0.0036)
age20	0.0284***	-0.0008	-0.0007	-0.0048
	(0.0026)	(0.0013)	(0.0022)	(0.0037)
age21	0.0250***	-0.0039***	-0.0081***	-0.0151***
	(0.0027)	(0.0013)	(0.0022)	(0.0037)
age22	0.0034	-0.0085***	-0.0171***	-0.0121***
	(0.0023)	(0.0011)	(0.0019)	(0.0038)
age23	-0.0070***	-0.0123***	-0.0225***	-0.0054
	(0.0022)	(0.0010)	(0.0018)	(0.0040)
age24	-0.0107***	-0.0127***	-0.0220***	-0.0105***
	(0.0022)	(0.0011)	(0.0019)	(0.0040)
age25	-0.0162***	-0.0134***	-0.0226***	-0.0074*
	(0.0022)	(0.0011)	(0.0020)	(0.0042)
age26_27	-0.0265***	-0.0172***	-0.0282***	-0.0288***
	(0.0018)	(0.0009)	(0.0017)	(0.0035)
age28_29	-0.0360***	-0.0178***	-0.0366***	-0.0674***
	(0.0016)	(0.0009)	(0.0015)	(0.0027)
age30_34	-0.0468***	-0.0238***	-0.0461***	-0.0832***
	(0.0014)	(0.0008)	(0.0013)	(0.0025)
age35_42	-0.0528***	-0.0186***	-0.0269***	0.0868***
	(0.0013)	(0.0009)	(0.0018)	(0.0050)
Education category(CAT I is the reference category)				
cat2	0.0210***	0.0050***	0.0064***	0.0143***
	(0.0021)	(0.0013)	(0.0019)	(0.0029)
cat3	0.0398***	0.0068***	0.0135***	0.0476***
	(0.0019)	(0.0012)	(0.0019)	(0.0028)
cat4	0.0156***	0.0058**	0.0078**	0.0433***
	(0.0049)	(0.0029)	(0.0036)	(0.0053)
cat5				0.4510*
				(0.2470)
cat_unknown	0.0765***	0.0229***	0.0408***	0.0588***
	(0.0037)	(0.0023)	(0.0032)	(0.0043)

Note: All rates are conditional attrition rates.*p<0.10;**p<0.05;***p<0.01

NAVY-M1	Attrition in 6 months	Attrition in the second 6 months	Attrition in the second year	Attrition in 45 months
Marital Status(single is the reference category)				
other_mar_stat		0.0003 (0.0141)	-0.0180 (0.0174)	0.0153 (0.0331)
married	-0.0808*** (0.0009)	-0.0270*** (0.0007)	-0.0297*** (0.0010)	-0.0181*** (0.0016)
mar_stat_unknown	0.4340*** (0.0221)	0.0540*** (0.0127)	0.1190*** (0.0222)	-0.0950*** (0.0134)
Education Credential(some high school(no diploma) is the reference category)				
some_college	-0.0326*** (0.0024)	-0.0122*** (0.0017)	-0.0271*** (0.0024)	-0.0383*** (0.0044)
HS_degree	-0.0498*** (0.0029)	-0.0173*** (0.0020)	-0.0447*** (0.0031)	-0.0481*** (0.0042)
educ_unknown	-0.0071** (0.0034)	0.0113*** (0.0033)	-0.0063* (0.0037)	-0.0376*** (0.0056)
alternate_educ	-0.0048** (0.0024)	0.0036* (0.0020)	0.0014 (0.0029)	-0.0029 (0.0048)
college_degree	-0.0327*** (0.0024)	-0.0110*** (0.0017)	-0.0292*** (0.0023)	-0.0643*** (0.0035)
doc_mas_above	-0.0175** (0.0081)	-0.0058 (0.0053)	-0.0178** (0.0077)	-0.0599*** (0.0110)
Race(white is the reference category)				
black	-0.0102*** (0.0009)	-0.0050*** (0.0006)	-0.0026*** (0.0010)	-0.0045*** (0.0015)
race_unknown	-0.0216*** (0.0037)	-0.0093*** (0.0025)	-0.0086* (0.0046)	-0.0338*** (0.0075)
race_others	-0.0252*** (0.0033)	-0.0068*** (0.0022)	-0.0249*** (0.0038)	-0.0232*** (0.0088)
hispan_95_99	-0.0124*** (0.0012)	-0.0044*** (0.0009)	-0.0131*** (0.0013)	-0.0276*** (0.0020)
Other				
unemployment	-0.0010* (0.0005)	-0.0001 (0.0003)	-0.0014** (0.0006)	-0.00004 (0.0009)
female	0.0013 (0.0010)	0.0017** (0.0007)	0.0054*** (0.0011)	0.0255*** (0.0018)
Observations	457,879	411,500	391,164	357,131

Note: All rates are conditional attrition rates.*p<0.10;**p<0.05;***p<0.01

NAVY-M2	Attrition based on character disorder in 6 months	Attrition based on character disorder in the second 6 months	Attrition based on character disorder in the second year	Attrition based on character disorder in 45 months
Enlistment Ages(age 17 is the reference category)				
age18	-0.0000	-0.0000	-0.0001	-0.0010***
	(0.0001)	(0.0001)	(0.0001)	(0.0003)
age19	0.0001	0.0000	-0.0001	-0.0010***
	(0.0295)	(0.0001)	(0.0001)	(0.0003)
age20	0.0002	0.0000	-0.0002	-0.0012***
	(0.0300)	(0.0001)	(0.0001)	(0.0003)
age21	0.0003	-0.0000	-0.0003***	-0.0016***
	(0.0522)	(0.0001)	(0.0001)	(0.0003)
age22	0.0001	-0.0002**	-0.0005***	-0.0022***
	(0.0224)	(0.0001)	(0.0001)	(0.0003)
age23	0.0001	-0.0003***	-0.0005***	-0.0024***
	(0.0163)	(0.0001)	(0.0001)	(0.0003)
age24	0.0002	-0.0002***	-0.0006***	-0.0027***
	(0.0438)	(0.0001)	(0.0001)	(0.0003)
age25	0.0001	-0.0003***	-0.0007***	-0.0031***
	(0.0112)	(0.0001)	(0.0001)	(0.0003)
age26_27	0.0002	-0.0003***	-0.0007***	-0.0034***
	(0.0311)	(0.0001)	(0.0001)	(0.0003)
age28_29	0.0000	-0.0003***	-0.0008***	-0.0036***
	(0.0016)	(0.0001)	(0.0001)	(0.0003)
age30_34	-0.0001	-0.0004***	-0.0010***	-0.0049***
	(0.0201)	(0.0001)	(0.0001)	(0.0004)
age35_42		-0.0005***	-0.0012***	-0.0054***
		(0.0001)	(0.0001)	(0.0005)
Education category(CAT I is the reference category)				
cat2	0.0002	0.0002	0.0002	-0.0002
	(0.0361)	(0.0001)	(0.0001)	(0.0004)
cat3	0.0001	0.0002	0.0003**	0.00004
	(0.0292)	(0.0001)	(0.0001)	(0.0004)
cat4	0.0006		-0.0002	-0.0007
	(0.1230)		(0.0003)	(0.0007)
cat5				
cat_unknown	0.0005	0.0006**	0.0013***	0.0017***
	(0.1000)	(0.0003)	(0.0003)	(0.0006)

Note: All rates are conditional attrition rates.*p<0.10;**p<0.05;***p<0.01

NAVY-M2	Attrition based on character disorder in 6 months	Attrition based on character disorder in the second 6 months	Attrition based on character disorder in the second year	Attrition based on character disorder in 45 months
Marital Status(single is the reference category)				
other_mar_stat			-0.0004 (0.0006)	-0.0027* (0.0014)
married	-0.0002 (0.0374)	-0.0008*** (0.0001)	-0.0016*** (0.0002)	-0.0049*** (0.0004)
mar_stat_unknown				
Education Credential(some high school(no diploma) is the reference category)				
some_college	0.0001 (0.0126)	-0.0003*** (0.0001)	-0.0002 (0.0002)	-0.0018*** (0.0005)
HS_degree	-0.0001 (0.0182)	-0.0004** (0.0002)	-0.0013*** (0.0003)	-0.0025*** (0.0006)
educ_unknown	-0.0001 (0.0263)	-0.0001 (0.0001)	-0.0004*** (0.0001)	-0.0016*** (0.0005)
alternate_educ	0.0001 (0.0109)	0.0000 (0.0001)	-0.00004 (0.0001)	0.0008 (0.0006)
college_degree	-0.0001 (0.0099)	-0.0003*** (0.0001)	-0.0006*** (0.0001)	-0.0028*** (0.0004)
doc_mas_above	-0.0001 (0.0183)	-0.0001 (0.0003)	-0.0008*** (0.0001)	-0.0035*** (0.0005)
Race(white is the reference category)				
black	-0.0001 (0.0201)	-0.0001*** (0.0000)	-0.0001 (0.0001)	0.0005*** (0.0002)
race_unknown	-0.00002 (0.0050)	-0.0003*** (0.0001)	-0.0004*** (0.0001)	-0.0007 (0.0007)
race_others	-0.0001 (0.0110)	-0.0004*** (0.0001)	-0.0004*** (0.0001)	-0.0020*** (0.0006)
hispan_95_99	-0.00002 (0.0048)	-0.0001* (0.0001)	-0.0001* (0.0001)	-0.0006** (0.0002)
Other				
unemployment	-0.0000 (0.0001)	-0.00004 (0.0000)	-0.0001*** (0.0000)	-0.0001 (0.0001)
female	0.0001 (0.0115)	-0.0002*** (0.0000)	-0.0005*** (0.0001)	-0.0025*** (0.0002)
Observations	104,892	157,486	233,637	284,796

Note: All rates are conditional attrition rates.*p<0.10;**p<0.05;***p<0.01

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Table 9. Air Force Attrition Rates by Recruit Characteristics

AIR FORCE-M1	Attrition in 6 months	Attrition in the second 6 months	Attrition in the second year	Attrition in 45 months
Enlistment Ages(age 17 is the reference category)				
age18	0.0113*** (0.0023)	-0.0066*** (0.0011)	-0.0089*** (0.0017)	-0.0144*** (0.0036)
age19	0.0184*** (0.0025)	-0.0071*** (0.0011)	-0.0084*** (0.0017)	-0.0083** (0.0037)
age20	0.0201*** (0.0027)	-0.0087*** (0.0011)	-0.0153*** (0.0016)	-0.0153*** (0.0038)
age21	0.0150*** (0.0028)	-0.0128*** (0.0011)	-0.0200*** (0.0016)	-0.0280*** (0.0039)
age22	0.0094*** (0.0029)	-0.0159*** (0.0010)	-0.0242*** (0.0016)	-0.0272*** (0.0042)
age23	0.0068** (0.0031)	-0.0173*** (0.0010)	-0.0264*** (0.0017)	-0.0362*** (0.0045)
age24	0.0067* (0.0035)	-0.0167*** (0.0012)	-0.0305*** (0.0017)	-0.0403*** (0.0049)
age25	0.0018 (0.0038)	-0.0187*** (0.0012)	-0.0299*** (0.0020)	-0.0383*** (0.0057)
age26_27	0.0160*** (0.0039)	-0.0169*** (0.0013)	-0.0292*** (0.0019)	-0.0459*** (0.0053)
age28_29	0.0168* (0.0089)	-0.0178*** (0.0029)	-0.0308*** (0.0044)	-0.0385*** (0.0120)
age30_34	0.0237** (0.0108)	-0.0147*** (0.0039)	-0.0327*** (0.0050)	-0.0577*** (0.0120)
age35_42	0.0341 (0.0269)	-0.0129 (0.0106)	0.0292 (0.0223)	0.0086 (0.0325)
Education category(CAT I is the reference category)				
cat2	0.0257*** (0.0035)	0.0040* (0.0021)	0.0137*** (0.0031)	0.0130*** (0.0050)
cat3	0.0502*** (0.0039)	0.0065*** (0.0022)	0.0306*** (0.0034)	0.0265*** (0.0051)
cat4	0.134*** (0.0260)	0.0235 (0.0159)	0.0347 (0.0213)	0.0647** (0.0323)
cat5				
cat_unknown	0.0606*** (0.0030)	0.0186*** (0.0019)	0.0130*** (0.0028)	-0.0241*** (0.0056)

Note: All rates are conditional attrition rates.*p<0.10;**p<0.05;***p<0.01

AIR FORCE-M1	Attrition in 6 months	Attrition in the second 6 months	Attrition in the second year	Attrition in 45 months
Marital Status(single is the reference category)				
other_mar_stat	0.0161**	0.0115**	0.0170***	0.0227**
	(0.0063)	(0.0048)	(0.0064)	(0.0112)
married	-0.0036***	-0.0076***	-0.0102***	0.0078***
	(0.0014)	(0.0008)	(0.0012)	(0.0028)
mar_stat_unknown	0.0342	-0.0127	0.138***	0.0785
	(0.0318)	(0.0132)	(0.0405)	(0.0538)
Education Credential(some high school(no diploma) is the reference category)				
some_college	-0.0482***	-0.0205***	-0.0363***	-0.0515***
	(0.0043)	(0.0018)	(0.0028)	(0.0093)
HS_degree	-0.0493***	-0.0288***	-0.0506***	-0.0460***
	(0.0084)	(0.0054)	(0.0078)	(0.0128)
educ_unknown	-0.0439***	-0.0149***	-0.0371***	-0.0635***
	(0.0046)	(0.0024)	(0.0028)	(0.0084)
alternate_educ	0.0228**	-0.0009	-0.0031	0.0151
	(0.0092)	(0.0044)	(0.0062)	(0.0151)
college_degree	-0.0489***	-0.0230***	-0.0393***	-0.0722***
	(0.0047)	(0.0017)	(0.0028)	(0.0088)
doc_mas_above	-0.0497***	-0.0275***	-0.0438***	-0.0822***
	(0.0063)	(0.0015)	(0.0031)	(0.0104)
Race(white is the reference category)				
black	-0.0259***	0.0034***	0.0095***	0.0275***
	(0.0010)	(0.0007)	(0.0011)	(0.0022)
race_unknown	-0.0318***	-0.0116***	-0.0088***	-0.0168***
	(0.0026)	(0.0016)	(0.0025)	(0.0055)
race_others	-0.0292***	-0.0051***	-0.0099***	-0.0173***
	(0.0018)	(0.0013)	(0.0018)	(0.0050)
hispan_95_99	-0.0355***	-0.0058***	-0.0122***	-0.0277***
	(0.0019)	(0.0014)	(0.0018)	(0.0035)
Other				
unemployment	-0.0005	0.0001	0.0001	0.0018**
	(0.0003)	(0.0002)	(0.0003)	(0.0007)
female	0.0364***	0.0087***	0.0174***	0.0343***
	(0.0011)	(0.0007)	(0.0009)	(0.0019)
Observations	495,770	434,808	394,117	230,218

Note: All rates are conditional attrition rates.*p<0.10;**p<0.05;***p<0.01

AIR FORCE-M2	Attrition based on character disorder in 6 months	Attrition based on character disorder in the second 6 months	Attrition based on character disorder in the second year	Attrition based on character disorder in 45 months
Enlistment Ages(age 17 is the reference category)				
age18	0.0020*	-0.0008**	-0.0009	-0.0009*
	(0.0011)	(0.0004)	(0.0057)	(0.0005)
age19	0.0033***	-0.0008**	-0.0003	-0.0009
	(0.0011)	(0.0004)	(0.0020)	(0.0006)
age20	0.0037***	-0.0009**	-0.0013	-0.0023***
	(0.0012)	(0.0004)	(0.0088)	(0.0007)
age21	0.0028**	-0.0016***	-0.0022	-0.0042***
	(0.0013)	(0.0004)	(0.0146)	(0.0008)
age22	0.0004	-0.0023***	-0.0027	-0.0041***
	(0.0012)	(0.0003)	(0.0179)	(0.0009)
age23	0.0001	-0.0024***	-0.0038	-0.0069***
	(0.0013)	(0.0003)	(0.0254)	(0.0010)
age24	0.0012	-0.0020***	-0.0043	-0.0073***
	(0.0015)	(0.0004)	(0.0292)	(0.0011)
age25	-0.0009	-0.0023***	-0.0044	-0.0068***
	(0.0015)	(0.0005)	(0.0302)	(0.0014)
age26_27	0.0025	-0.0019***	-0.0033	-0.0096***
	(0.0017)	(0.0005)	(0.0225)	(0.0011)
age28_29	-0.0026	-0.0022**	-0.0063	-0.0128***
	(0.0032)	(0.0011)	(0.0443)	(0.0012)
age30_34	-0.0099***		-0.0039	-0.0192***
	(0.0026)		(0.0262)	(0.0005)
age35_42				-0.0203***
				(0.0004)
Education category(CAT I is the reference category)				
cat2	0.0090**	-0.0009	0.0026	0.0095***
	(0.0038)	(0.0007)	(0.0169)	(0.0016)
cat3	0.0136***	-0.0002	0.0054	0.0127***
	(0.0044)	(0.0008)	(0.0341)	(0.0015)
cat4				0.0140***
				(0.0036)
cat5				
cat_unknown	0.0144***	0.0010	0.0021	0.0191***
	(0.0014)	(0.0007)	(0.0139)	(0.0022)

Note: All rates are conditional attrition rates.*p<0.10;**p<0.05;***p<0.01

AIR FORCE-M2	Attrition based on character disorder in 6 months	Attrition based on character disorder in the second 6 months	Attrition based on character disorder in the second year	Attrition based on character disorder in 45 months
Marital Status(single is the reference category)				
other_mar_stat	0.0051	-0.0013	0.0025	-0.0078***
	(0.0032)	(0.0013)	(0.0160)	(0.0021)
married	0.0013**	-0.0016***	-0.0030	-0.0129***
	(0.0006)	(0.0003)	(0.0199)	(0.0007)
mar_stat_unknown			0.021	
			(0.1200)	
Education Credential(some high school(no diploma) is the reference category)				
some_college	-0.0072***	-0.0024***	-0.0039	-0.0012
	(0.0018)	(0.0006)	(0.0267)	(0.0030)
HS_degree	-0.0096***	-0.0034**	-0.0045	-0.0036
	(0.0033)	(0.0016)	(0.0285)	(0.0028)
educ_unknown	-0.0091***	-0.0027***	-0.0048	0.0005
	(0.0012)	(0.0005)	(0.0326)	(0.0030)
alternate_educ	0.0045	0.0004	0.0016	0.0069**
	(0.0036)	(0.0015)	(0.0103)	(0.0033)
college_degree	-0.0096***	-0.0030***	-0.0047	-0.0115***
	(0.0017)	(0.0007)	(0.0323)	(0.0022)
doc_mas_above	-0.0050*	-0.0027***	-0.0052	-0.0106***
	(0.0027)	(0.0009)	(0.0359)	(0.0027)
Race(white is the reference category)				
black	-0.0092***	-0.0005*	0.0011	0.0104***
	(0.0004)	(0.0002)	(0.0072)	(0.0008)
race_unknown	-0.0051***	-0.0023***	-0.0021	-0.0050***
	(0.0009)	(0.0004)	(0.0141)	(0.0007)
race_others	-0.0055***	-0.0011***	-0.0007	-0.0019
	(0.0006)	(0.0004)	(0.0043)	(0.0012)
hispan_95_99	-0.0114***	-0.0014*	-0.0004	-0.0043***
	(0.0014)	(0.0007)	(0.0027)	(0.0011)
Other				
unemployment	0.0001	-0.0001	0.00003	-0.00004
	(0.0001)	(0.0001)	(0.0002)	(0.0001)
female	0.0093***	0.0010***	-0.0007	-0.0047***
	(0.0005)	(0.0002)	(0.0044)	(0.0007)
Observations	368,493	349,303	339,649	375,705

Note: All rates are conditional attrition rates.*p<0.10;**p<0.05;***p<0.01

Table 10.   Marine Corps Attrition Rates by Recruit Characteristics

MARINE CORPS-M1	Attrition in 6 months	Attrition in the second 6 months	Attrition in the second year	Attrition in 45 months
Enlistment Ages(age 17 is the reference category)				
age18	0.0610***	0.0103***	-0.0067***	0.0010
	(0.0014)	(0.0008)	(0.0008)	(0.0015)
age19	0.1040***	0.0135***	-0.0009	0.0095***
	(0.0021)	(0.0010)	(0.0010)	(0.0018)
age20	0.1280***	0.0144***	0.0022*	0.0124***
	(0.0027)	(0.0012)	(0.0012)	(0.0022)
age21	0.1330***	0.0121***	-0.0041***	0.0076***
	(0.0031)	(0.0014)	(0.0013)	(0.0025)
age22	0.1320***	0.0114***	-0.0136***	0.0116***
	(0.0034)	(0.0016)	(0.0013)	(0.0028)
age23	0.1380***	0.0094***	-0.0110***	0.0042
	(0.0040)	(0.0018)	(0.0016)	(0.0031)
age24	0.1570***	0.0084***	-0.0118***	0.0023
	(0.0047)	(0.0021)	(0.0018)	(0.0036)
age25	0.1530***	0.0167***	-0.0157***	0.0057
	(0.0053)	(0.0027)	(0.0020)	(0.0041)
age26_27	0.1560***	0.0101***	-0.0155***	0.0001
	(0.0048)	(0.0023)	(0.0018)	(0.0035)
age28_29	0.1230***	0.0017	-0.0181***	-0.0133***
	(0.0058)	(0.0028)	(0.0023)	(0.0040)
age30_34	-0.0038	-0.0237***	-0.0374***	-0.0466***
	(0.0028)	(0.0015)	(0.0013)	(0.0026)
age35_42	-0.0477***	-0.0211***	-0.00284	0.2210***
	(0.0011)	(0.0018)	(0.0025)	(0.0064)
Education category(CAT I is the reference category)				
cat2	0.0057***	0.0044***	0.0072***	0.0129***
	(0.0016)	(0.0015)	(0.0019)	(0.0031)
cat3	0.0161***	0.0101***	0.0141***	0.0275***
	(0.0016)	(0.0014)	(0.0018)	(0.0030)
cat4	0.0450***	0.0100***	0.0216***	0.0265***
	(0.0049)	(0.0038)	(0.0049)	(0.0066)
cat5				
cat_unknown	0.0851***	0.0480***	0.0619***	0.0708***
	(0.0031)	(0.0026)	(0.0031)	(0.0042)

Note: All rates are conditional attrition rates.*p<0.10;**p<0.05;***p<0.01

MARINE CORPS-M1	Attrition in 6 months	Attrition in the second 6 months	Attrition in the second year	Attrition in 45 months
Marital Status(single is the reference category)				
other_mar_stat	-0.0210*** (0.0020)	-0.0095*** (0.0025)	-0.0035 (0.0031)	-0.0004 (0.0044)
married	-0.0330*** (0.0007)	-0.0202*** (0.0008)	-0.0225*** (0.0011)	-0.0205*** (0.0018)
mar_stat_unknown			0.1480 (0.1310)	0.1840 (0.1620)
Education Credential(some high school(no diploma) is the reference category)				
some_college	-0.0119*** (0.0036)	-0.0111*** (0.0028)	-0.0238*** (0.0029)	-0.0170** (0.0070)
HS_degree	-0.0162*** (0.0045)	-0.0180*** (0.0040)	-0.0368*** (0.0053)	-0.0185** (0.0074)
educ_unknown	0.0065 (0.0047)	0.0040 (0.0038)	-0.0153*** (0.0034)	0.0065 (0.0085)
alternate_educ	0.0105** (0.0045)	-0.0047 (0.0029)	-0.0107*** (0.0034)	0.0110 (0.0076)
college_degree	-0.0172*** (0.0034)	-0.0121*** (0.0030)	-0.0212*** (0.0034)	-0.0237*** (0.0072)
doc_mas_above	-0.0215*** (0.0037)	-0.0161*** (0.0031)	-0.0307*** (0.0033)	-0.0337*** (0.0087)
Race(white is the reference category)				
black	-0.0072*** (0.0008)	-0.0087*** (0.0007)	-0.0072*** (0.0009)	0.0108*** (0.0016)
race_unknown	-0.0045*** (0.0013)	-0.0060*** (0.0010)	-0.0143*** (0.0012)	-0.0222*** (0.0022)
race_others	-0.0069*** (0.0017)	-0.0038*** (0.0014)	-0.0110*** (0.0018)	-0.0170*** (0.0035)
hispan_95_99	-0.0120*** (0.0011)	-0.0125*** (0.0012)	-0.0136*** (0.0014)	-0.0164*** (0.0022)
Other				
unemployment	-0.0006*** (0.0002)	-0.00001 (0.0002)	-0.0002 (0.0002)	-0.0008** (0.0004)
female	0.0559*** (0.0014)	0.0265*** (0.0012)	0.0245*** (0.0014)	0.0116*** (0.0021)
Observations	664,141	606,089	565,814	410,908

Note: All rates are conditional attrition rates.*p<0.10;**p<0.05;***p<0.01

MARINE CORPS-M2	Attrition based on character disorder in 6 months	Attrition based on character disorder in the second 6 months	Attrition based on character disorder in the second year	Attrition based on character disorder in 45 months
Enlistment Ages(age 17 is the reference category)				
age18	0.0009*** (0.0002)	0.0048*** (0.0004)	0.0016*** (0.0003)	
age19	0.0016*** (0.0003)	0.0092*** (0.0006)	0.0026*** (0.0004)	
age20	0.0016*** (0.0004)	0.0097*** (0.0008)	0.0015*** (0.0005)	
age21	0.0020*** (0.0005)	0.0079*** (0.0009)	0.0014** (0.0006)	
age22	0.0020*** (0.0005)	0.0099*** (0.0012)	-0.0006 (0.0006)	
age23	0.0025*** (0.0007)	0.0089*** (0.0013)	-0.0011 (0.0007)	
age24	0.0011** (0.0005)	0.0074*** (0.0015)	0.0007 (0.0010)	
age25	0.0015* (0.0008)	0.0158*** (0.0025)	-0.0012 (0.0011)	
age26_27	0.0037*** (0.0011)	0.0097*** (0.0019)	-0.0014 (0.0010)	
age28_29	0.0042** (0.0018)	0.0072*** (0.0025)	-0.0019 (0.0014)	
age30_34		0.0009 (0.0018)	-0.0063*** (0.0009)	
age35_42		-0.0026** (0.0010)	-0.0091*** (0.0005)	
Education category(CAT I is the reference category)				
cat2	0.0002 (0.0001)	0.0024*** (0.0006)	0.0044*** (0.0009)	
cat3	0.0003** (0.0001)	0.0033*** (0.0006)	0.0055*** (0.0008)	
cat4	0.0001 (0.0002)	0.0043*** (0.0017)	0.0105*** (0.0026)	
cat5				
cat_unknown	0.0005** (0.0002)	0.0049*** (0.0009)	0.0088*** (0.0013)	

Note: All rates are conditional attrition rates.*p<0.10;**p<0.05;***p<0.01

MARINE CORPS-M2	Attrition based on character disorder in 6 months	Attrition based on character disorder in the second 6 months	Attrition based on character disorder in the second year	Attrition based on character disorder in 45 months
Marital Status(single is the reference category)				
other_mar_stat	-0.0002 (0.0002)	-0.0017** (0.0007)	-0.0043*** (0.0012)	
married	-0.0002*** (0.0001)	-0.0021*** (0.0002)	-0.0070*** (0.0004)	
mar_stat_unknown				
Education Credential(some high school(no diploma) is the reference category)				
some_college	0.0001 (0.0004)	0.0002 (0.0011)	-0.0026* (0.0013)	
HS_degree	0.0001 (0.0002)	-0.0004 (0.0009)	-0.0045** (0.0018)	
educ_unknown	0.00002 (0.0003)	-0.0010 (0.0008)	-0.0036*** (0.0011)	
alternate_educ	0.0007 (0.0007)	0.0036** (0.0017)	0.0026 (0.0017)	
college_degree	-0.0003*** (0.0001)	-0.0024*** (0.0005)	-0.0084*** (0.0005)	
doc_mas_above	-0.0002 (0.0002)	-0.0024*** (0.0006)	-0.0054*** (0.0013)	
Race(white is the reference category)				
black	-0.00004 (0.0001)	-0.0009*** (0.0002)	-0.0000 (0.0004)	
race_unknown	0.0000 (0.0001)	-0.0002 (0.0003)	-0.0026*** (0.0004)	
race_others	-0.0001 (0.0001)	-0.0006 (0.0004)	-0.0021*** (0.0006)	
hispan_95_99	0.0001 (0.0003)	-0.0018*** (0.0004)	-0.0029*** (0.0008)	
Other				
unemployment	0.0000 (0.0000)	-0.0001** (0.0000)	-0.00006 (0.0001)	
female	0.0004*** (0.0001)	0.00002 (0.0003)	0.0012** (0.0005)	
Observations	468,435	483,887	488,235	

Note: All rates are conditional attrition rates.*p<0.10;**p<0.05;***p<0.01

1. THE ARMY

Attrition rates for army recruits between the ages of 18 and 29 are higher than age 17 in the first six months. Besides, the age cohorts 30–34 and 35–42 have a negative effect on attrition in the first six months. Interestingly, all results for age variables are statistically significant and have smaller attrition probability than the age of 17 for the second year. After completing six months of service successfully, basic training, recruits older than 26 years old at entry are less likely to leave in the first term.

For the second model, recruits between 18 and 34 years old are more probable to attrite, whereas recruits in the age cohort 35–42 have statistically insignificant attrition rates for the first six months. After the second year in service, attrition rates based on character disorder are significantly decreasing while the enlistment age is increasing.

Education categories show statistically significant results for all periods except Category 5. Recruits in CAT I are less likely to attrite than the other categories for all terms. The likelihood of married enlistees' attrition is smaller than single enlistees' for all terms. Blacks and Hispanics are less likely to attrite than Whites for all periods. Female attrition rates are higher than male attrition rates for four terms. Enlistees having alternate educations are more probable to attrite than the others. The unemployment rate is statistically significant for the second six months, and there is a higher second-year attrition likelihood of enlistees.

According to the second model, Blacks are less likely to attrite in the first year of their service, whereas their attrition probability is increasing in the second, third, and fourth years. The unemployment rate is statistically significant for all terms in the second model. Other demographic variables have a similar effect on attrition as mentioned earlier.

2.   THE NAVY

Navy M1 table provides the full results for the 6, 12, 24, 45-months attrition models. The results of six months period are statistically significant except age 18. The study indicates that the attrition rate for six month in Navy is higher for the ages between 18 and 22 than age 17. From the age of 22 to 42, Navy enlistees are less probable to leave in the first six months than age 17. After the age of 24; the attrition likelihood demonstrates a decreasing pattern until age 42.

For the second six months, and in the second years as well, the older the enlistment age the less probable to attrite for enlistees until the age of 35 except the ages 19, 20, which are statistically insignificant. The attrition rate for the 45 months is smaller for the all ages than age 17 except the ages of 19, 20, and 23. The most important results which show an increasingly decreasing likelihood are presented after the age 27.

For the second model, Navy attrition rates by recruit characteristics based on character disorder is not statistically significant for the first six months by age groups. It is so difficult to determine character disorder for recruits in the first six months. People can hide their bad behaviors due to the first year`s vigorous training. However; for the second six months, attrition rates are significant for the ages older than 22.Recruits older than 22 are less probable to attrite according to Navy M2 table. The same pattern can be seen for the second years for the recruits older than 21.

Education categories show statistically significant results for all periods except category 5. Recruits in CAT I are less likely to attrite than the other Categories for all terms. The likelihood of married enlistees' attrition is smaller than single enlistees' for all terms. Blacks and Hispanics are less likely to attrite than Whites for all terms. Female attrition rates for the first term are statistically insignificant but for the other terms, females' attrition rate is higher than male enlistees'. The unemployment rate is statistically significant just for the first six months, and the second year.

In relation to the second model, Blacks are less likely to attrite in the first year of their service whereas their attrition probability is higher in the fourth year than Whites. Unemployment rate is statistically significant for only the second year attrition rate. Surprisingly, females are less likely to attrite due to character disorder for all terms except the first one.

3.   THE AIR FORCE

The most specific result with the air force data for the first term attrition rates is insignificant rates for age cohort 35–42, because the sample size is very tiny. Attrition rates for first six-months increases with the enlistment age, whereas it decreases for the second six-months, second year, and 45-month periods.

For the second model, Air Force attrition rates, by recruit characteristics based on character disorders, are completely insignificant for all enlistment ages in the second year period. Age had a negative effect on attrition, based on character disorder for 6–12 months, and 24–45 months periods.

Education categories have same patterns as mentioned for The Navy. However, Cat V is dropped. Recruits in CAT I are less likely to attrite than the other Categories for all terms. The likelihood of married enlistees' attrition is smaller than single enlistees' for all terms. Hispanics are less likely to attrite than Whites for all terms. Remarkably, Blacks are less likely to attrite in the first six months, but are more probable to leave in other terms. Female attrition rate for all terms is statistically significant. Female attrition rates are higher than male enlistees. Unemployment rate is statistically significant for the 45-month attrition rate.

In accordance with the second model, Blacks are less likely to attrite in the first year of their service, whereas their attrition probability is higher in the fourth year than Whites. The unemployment rate is statistically insignificant for all terms. Surprisingly, females are less likely to attrite in 45 months, due to character disorder, while they are more likely to attrite in the first year of service.

4. MARINE CORPS

Enlistment Age has a positive effect on attrition in the first year for ages 18 and 29. Remarkably, age cohort 19–20 is more likely to attrite for all service periods than age 17. The second year`s attrition rate decreases with the ages 24 and 34.

Attrition rates based on character disorder increased with the enlistment age until the age of 30 for the first year. Surprisingly, we could not find any results for attrition of 45-months based on character disorder, even after 1,000 regression iterations.

Education categories have same patterns as mentioned for The Navy. However, Cat V is dropped. Recruits in CAT I are less likely to attrite than the other categories for all terms. The likelihood of married enlistees' attrition is smaller than single enlistees' for all terms. Hispanics are less likely to attrite than Whites for all terms. Remarkably, Blacks are less likely to attrite in the first two years whereas they are more probable to leave in the 24–45 months period. Female attrition rate for all terms is statistically significant. Females' attrition rate is higher than male enlistees'. The unemployment rate is statistically significant just for the first six-month and 45-month period terms.

According to the second model, Blacks are less likely to attrite in the second six months period, whereas their attrition rate is statistically insignificant for the other terms. Females are more likely to attrite in the first six month and 12–24 months period due to character disorder.

VI.   CONCLUSION

The primary focus of this thesis was to analyze the effect of different enlistment ages on first-term attrition rates for four forces. Two probit models were used to predict attrition behavior. Although the primary variable in this thesis is enlistment age, other variables that may affect attrition are also evaluated; gender, marital status, education level, race, annual state unemployment rates.

According to our findings, enlistment ages do significantly affect the attrition of enlisted personnel. This effect varies across different time periods—first six months, second six months, second year, and 45-months—and different forces.

In the first model, the 45-months` attrition results of the Army show that enlistees between 18 and 25 are more likely to leave the service than 17-year-old enlistees, whereas enlistees older than 26 do better. In the second model, according to the 45-months attrition results, the older the enlistees at their entry, the lower to attrite based on character disorder.

Navy attrition results in the first model indicate that all the enlistment ages` attrition probability is lower than the age of 17, except age 19, age 20, and age 23, which are statistically insignificant. All Navy results in the model were based on character disorder, and attrition probability of all ages is smaller than the base age.

The results of the Air Force are exceptionally stable compared to other forces. Namely, attrition probability is higher in the first six months, but it is lower in all other periods compared with the base age 17. Attrition rates based on character disorder in the 45-months period are similar to the Army and Navy rates.

Marine Corps have the most statistically insignificant results in the 45-month period. Furthermore, there is no trend in terms of attrition behavior, which is different from other forces as well. In the second model, we could not find any results in 45-month period, even after 1000 regression iterations.

The results are consistent with previous studies regarding attrition and education, attrition and gender, attrition and demographics for all forces. The higher the education level, the lower the attrition rate. Single enlistees are more likely to leave than married ones. Males are less likely to attrite than females according to first model, whereas female attrition probability is lower than male attrition in the second model. Blacks are more likely to attrite than Whites in the second model for 45-month period.

The outcomes of this thesis suggest that age at entry can be used as a predictor of the first-term attrition, along with other variables. We recommend further research to analyze the effects of enlistment ages on attrition, by excluding prior service enlistees in the data.

APPENDIX. AGE REQUIREMENTS AND RECRUITMENT

A. MINIMUM AND MAXIMUM AGE REQUIREMENTS OF COUNTRIES HAVING ONLY VOLUNTARY SYSTEMS

Table 12 shows the minimum and maximum enlistment age of the counties having voluntary system all over the World.

Table 11. Countries Having Only Voluntary System. Adapted from *The World Factbook*, 2013. Retrieved from https://www.cia.gov/library/publications/the-world-factbook/fields/print_2024.html

NO	COUNTRIES	MIN ENLISTMENT AGE	MAX ENLISTMENT AGE
1	Afghanistan	18	
2	Albania	19	
3	Antigua and Barbuda	18	
4	Australia	17	
5	Azerbaijan	17	35
6	Bahamas, The	18	
7	Bahrain	18	
8	Bangladesh	16	
9	Barbados	18	
10	Belgium	18	
11	Belize	18	
12	Bermuda	18	45
13	Bhutan	18	
14	Bosnia and Herzegovina	18	35
15	Botswana	18	
16	Brunei	17	
17	Bulgaria	18	27
18	Burkina Faso	18	
19	Burma	18	35
20	Burundi	18	45
21	Cameroon	18	23
22	Canada	17	34
23	Chile	18	45
24	Comoros	18	
25	Congo, Republic of the	18	
26	Croatia	18	27

NO	COUNTRIES	MIN ENLISTMENT AGE	MAX ENLISTMENT AGE
27	Czech Republic	18	28
28	Djibouti	18	
29	Dominican Republic	17	21
30	Ethiopia	18	
31	Fiji	18	
32	France	17	40
33	Gabon	20	
34	Gambia, The	18	
35	Germany	17	23
36	Ghana	18	26
37	Guyana	16	
38	Holy See (Vatican City)	19	30
39	Honduras	18	
40	Hungary	18	25
41	India	16	18
42	Indonesia	18	45
43	Iraq	18	40
44	Ireland	17	27
45	Italy	18	25
46	Japan	18	
47	Kenya	18	26
48	Kuwait	17	21
49	Latvia	18	
50	Lebanon	17	30
51	Lesotho	18	24
52	Liberia	18	
53	Lithuania	18	
54	Luxembourg	18	24
55	Macedonia	18	
56	Madagascar	18	25
57	Malawi	18	
58	Malaysia	17,5	
59	Maldives	18	28
60	Malta	17,5	
61	Mauritania	18	
62	Montenegro	18	
63	Morocco	20	
64	Namibia	18	
65	Nepal	18	

NO	COUNTRIES	MIN ENLISTMENT AGE	MAX ENLISTMENT AGE
66	Netherlands	17	
67	New Zealand	17	
68	Nicaragua	18	30
69	Nigeria	18	
70	Oman	18	30
71	Pakistan	16	23
72	Papua New Guinea	16	
73	Peru	18	50
74	Philippines	17	23
75	Poland	18	28
76	Portugal	18	30
77	Qatar	18	
78	Rwanda	18	
79	Saint Kitts and Nevis	18	
80	Saint Lucia	18	
81	San Marino	18	
82	Saudi Arabia	17	
83	Serbia	18	
84	Seychelles	18	
85	Sierra Leone	18	
86	Slovakia	18	30
87	Slovenia	18	25
88	South Africa	18	
89	Spain	18	26
90	Sri Lanka	18	22
91	Suriname	18	
92	Swaziland	18	30
93	Sweden	18	47
94	Tanzania	18	
95	Timor-Leste	18	
96	Tonga	16	
97	Trinidad and Tobago	18	25
98	Uganda	18	26
99	United Arab Emirates	18	
100	United Kingdom	16	33
101	United States	17	
102	Uruguay	18	30
103	Yemen	18	

NO	COUNTRIES	MIN ENLISTMENT AGE	MAX ENLISTMENT AGE
104	Zambia	16	25
105	Zimbabwe	18	24

B. MINIMUM AND MAXIMUM AGE REQUIREMENTS OF THE COUNTRIES HAVING ONLY COMPULSORY SYSTEMS

Table 12.   Counties Having Only Compulsory System

COUNTRIES HAVING ONLY COMPULSORY SYSTEM			
NO	COUNTRIES	MIN ENLISTMENT AGE	MAX ENLISTMENT AGE
1	Belarus	18	27
2	Cabo Verde	18	35
3	Central African Republic	18	
4	China	18	24
5	Cuba	17	28
6	Estonia	18	27
7	Romania	20	35
8	Turkey	21	41
9	Uzbekistan	18	
10	Guatemala	17	21

Adapted from *The World Factbook*, 2013. Retrieved from
https://www.cia.gov/library/publications/the-world-factbook/fields/print_2024.html

C. MINIMUM AND MAXIMUM AGE REQUIREMENTS OF THE COUNTRIES HAVING BOTH RECRUITMENT SYSTEMS

There are sixty counties having both compulsory and voluntary systems. These countries are shown in Table 14.

Table 13.   Countries Having both Compulsory and Voluntary System

NO	COUNTRY	VOLUNTARY SYSTEM		COMPULSORY SYSTEM	
		MIN ENLISTMENT AGE	MAX ENLISTMENT AGE	MIN ENLISTMENT AGE	MAX ENLISTMENT AGE
1	Algeria	17		19	30
2	Angola	18		20	45
3	Argentina	18	24	18	24
4	Armenia	18	27	18	27
5	Austria	18		18	50
6	Benin	18	35	18	35
7	Bolivia	17		18	49
8	Brazil	17	45	18	45
9	Cambodia	18		18	
10	Chad	18		20	
11	Colombia	18	24	18	24
12	Congo, Democratic Republic	18	45	18	45
13	Cote d'Ivoire	18	25	18	25
14	Cyprus	17		18	50
15	Denmark	18		18	
16	Ecuador	18		18	
17	Egypt	16		18	30
18	El Salvador	16	22	18	
19	Equatorial Guinea	18		18	
20	Eritrea	18	40	18	40
21	Finland	18		18	
22	Georgia	18	34	18	34
23	Greece	18		19	45
24	Guinea	18	25	18	25
25	Guinea-Bissau	16		18	25

	COUNTRIES HAVING BOTH SYSTEMS				
26	Iran	16		18	
27	Israel	17		18	
28	Jordan	17		18	
29	Kazakhstan	19		18	
30	Korea, North	16		18	
31	Korea, South	18	26	20	30
32	Kyrgyzstan	18	27	18	27
33	Laos	18		18	
34	Libya	18		18	
35	Mali	18		18	
36	Mexico	16		18	
37	Moldova	18		18	
38	Mongolia	18	25	18	25
39	Mozambique	18		18	35
40	Niger	18		18	
41	Norway	17		19	35
42	Paraguay	18		18	
43	Russia	18	27	18	27
44	Sao Tome and Principe	17		18	
45	Senegal	18		20	
46	Singapore	16,5		18	21
47	Somalia	18		18	
48	South Sudan	18		18	
49	Sudan	18	33	18	33
50	Switzerland	18		19	26
51	Syria	18		18	
52	Taiwan	18	35	18	35
53	Tajikistan	18	27	18	27
54	Thailand	18		21	
55	Togo	18		18	
56	Tunisia	18	23	20	23
57	Turkmenistan	20		18	27
58	Ukraine	18	25	18	25
59	Venezuela	18	30	18	30
60	Vietnam	18	25	18	25

Adapted from *The World Factbook*, 2013. Retrieved from
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